



YAMAHA

2008

SERVICE MANUAL

YFM250RX

RAPTOR
250

EBS00001

**YFM250RX
SERVICE MANUAL
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NOTICE

This manual was produced by the Yamaha Motor Company primarily for use by Yamaha dealers and their qualified mechanics. It is not possible to include all the knowledge of a mechanic in one manual, so it is assumed that anyone who uses this book to perform maintenance and repairs on Yamaha machine has a basic understanding of the mechanical ideas and the procedures of machine repair. Repairs attempted by anyone without this knowledge are likely to render the machine unsafe and unfit for use.

Yamaha Motor Company, Ltd. is continually striving to improve all its models. Modifications and significant changes in specifications or procedures will be forwarded to all authorized Yamaha dealers and will appear in future editions of this manual where applicable.

NOTE:

Designs and specifications are subject to change without notice.

IMPORTANT INFORMATION

Particularly important information is distinguished in this manual by the following notations.



The Safety Alert Symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!



Failure to follow WARNING instructions could result in severe injury or death to the machine operator, a bystander or a person checking or repairing the machine.

CAUTION:

A CAUTION indicates special precautions that must be taken to avoid damage to the machine.

NOTE:

A NOTE provides key information to make procedures easier or clearer.

HOW TO USE THIS MANUAL

MANUAL ORGANIZATION

This manual consists of chapters for the main categories of subjects. (See “symbols”)

1st title ①: This is the title of the chapter with its symbol in the upper right corner of each page.

2nd title ②: This title indicates the section of the chapter and only appears on the first page of each section. It is located in the upper left corner of the page.

3rd title ③: This title indicates a sub-section that is followed by step-by-step procedures accompanied by corresponding illustrations.

EXPLODED DIAGRAMS

To help identify parts and clarify procedure steps, there are exploded diagrams at the start of each removal and disassembly section.

1. An easy-to-see exploded diagram ④ is provided for removal and disassembly jobs.
2. Numbers ⑤ are given in the order of the jobs in the exploded diagram. A number that is enclosed by a circle indicates a disassembly step.
3. An explanation of jobs and notes is presented in an easy-to-read way by the use of symbol marks ⑥. The meanings of the symbol marks are given on the next page.
4. A job instruction chart ⑦ accompanies the exploded diagram, providing the order of jobs, names of parts, notes in jobs, etc.
5. For jobs requiring more information, the step-by-step format supplements ⑧ are given in addition to the exploded diagram and the job instruction chart.

② CLUTCH ① ENG

CLUTCH

④

⑥

⑤

⑦

Order	Job/Parts to remove	Q'ty	Remarks
Removing the clutch cover			
	Engine oil		Remove the parts in the order listed. Drain.
1	Cotter pin/Washer	1/1	
2	Clevis pin	1	
3	Brake pedal/Footrest	1/1	
4	Oil delivery pipe	1	
5	Oil cooler hose	2	
6	O-ring	2	
7	Right crankcase cover	1	
8	Dowel pin	2	
9	Crankcase cover gasket	1	
For installation, reverse the removal procedure.			

CLUTCH ENG

CHECKING THE FRICTION PLATES

The following procedure applies to all of the friction plates.

1. Check:
 - Friction plate
 - Damage/wear → Replace the friction plate.
2. Measure:
 - Friction plate thickness
 - Out of specification → Replace the friction plate.

NOTE:

Measure the friction plate at four places.

Friction plate thickness
2.90 - 3.10 mm (0.114 - 0.122 in)
Wear limit
2.80 mm (0.1102 in)

CHECKING THE CLUTCH PLATES










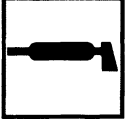



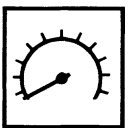
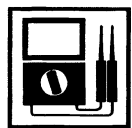









The following procedure applies to all of the clutch plates.

1. Check:
 - Clutch plate
 - Damage → Replace the clutch plate.
2. Measure:
 - Clutch plate warpage (with a surface plate and thickness gauge ①)
 - Out of specification → Replace the clutch plate.

Warpage limit
0.20 mm (0.0079 in)

4-38

4-43

① GEN INFO 	② SPEC 		
③ CHK ADJ 	④ ENG 		
⑤ CARB 	⑥ CHAS 		
⑦ ELEC 	⑧ TRBL SHTG ?		
⑨ 	⑩ 		
⑪ 	⑫ 		
⑬ 	⑭ 		
⑮ 	⑯ 		
⑰ 	⑱ 	⑲ 	⑳ 
㉑ 	㉒ 	㉓ 	㉔ 
㉕ 	㉖ New		

SYMBOLS

The following symbols are not relevant to every machine.

Symbols ① to ⑧ indicate the subject of each chapter.

- ① General information
- ② Specifications
- ③ Periodic checks and adjustments
- ④ Engine
- ⑤ Carburetor
- ⑥ Chassis
- ⑦ Electrical
- ⑧ Troubleshooting

Symbols ⑨ to ⑯ indicate the following

- ⑨ Serviceable with engine mounted
- ⑩ Filling fluid
- ⑪ Lubricant
- ⑫ Special tool
- ⑬ Torque
- ⑭ Wear limit, clearance
- ⑮ Engine speed
- ⑯ Electrical data (Ω , V, A)








Symbols ⑰ to ㉕ in the exploded diagrams indicate the types of lubricants and lubrication points.

- ⑰ Apply engine oil
- ⑱ Apply gear oil
- ⑲ Apply molybdenum disulfide oil
- ⑳ Apply brake fluid
- ㉑ Apply wheel bearing grease
- ㉒ Apply lithium-soap-based grease
- ㉓ Apply molybdenum disulfide grease
- ㉔ Apply silicone grease

Symbols ㉕ to ㉖ in the exploded diagrams indicate where to apply a locking agent ㉕ and when to install a new part ㉖.

- ㉕ Apply the locking agent (LOCTITE®)
- ㉖ Replace

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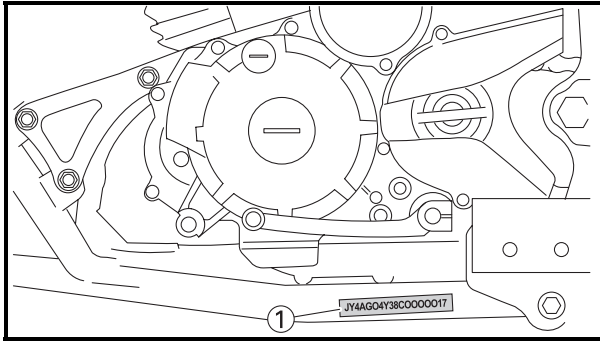
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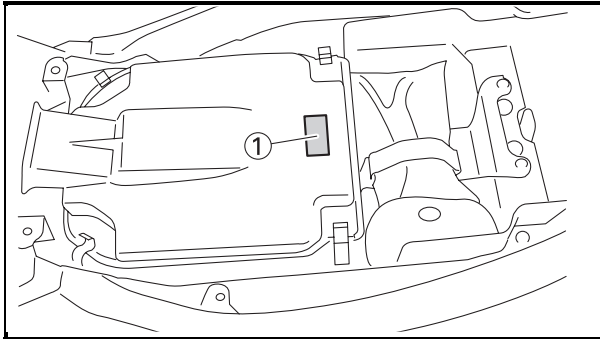
GENERAL INFORMATION

MACHINE IDENTIFICATION

EBS00010

VEHICLE IDENTIFICATION NUMBER

The vehicle identification number ① is stamped into the left side of the frame.



EBS00011

MODEL LABEL

The model label ① is affixed to the air filter case cover. This information will be needed to order spare parts.

EBS00013

**IMPORTANT INFORMATION
PREPARATION FOR REMOVAL AND
DISASSEMBLY**

1. Before removal and disassembly remove all dirt, mud, dust and foreign material.
2. Use only the proper tools and cleaning equipment.
Refer to "SPECIAL TOOLS".
3. When disassembling always keep mated parts together. This includes gears, cylinders, pistons and other parts that have been "mated" through normal wear. Mated parts must always be reused or replaced as an assembly.
4. During disassembly, clean all of the parts and place them in trays in the order of disassembly. This will speed up assembly and allow for the correct installation of all parts.
5. Keep all parts away from any source of fire.

1

EBS00014

REPLACEMENT PARTS

1. Use only genuine Yamaha parts for all replacements. Use oil and grease recommended by Yamaha for all lubrication jobs. Other brands may be similar in function and appearance, but inferior in quality.

EBS00015

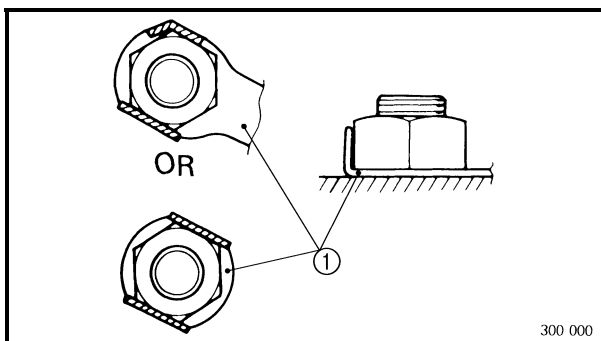
GASKETS, OIL SEALS AND O-RINGS

1. When overhauling the engine, replace all gaskets, seals and O-rings. All gasket surfaces, oil seal lips and O-rings must be cleaned.
2. During reassembly properly oil all mating parts and bearings, and lubricate the oil seal lips with grease.

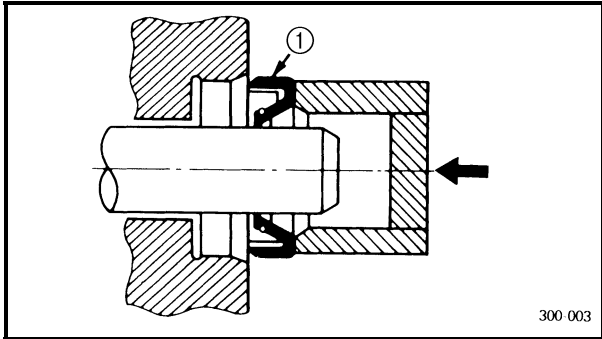
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LOCK WASHERS/PLATES AND COTTER PINS

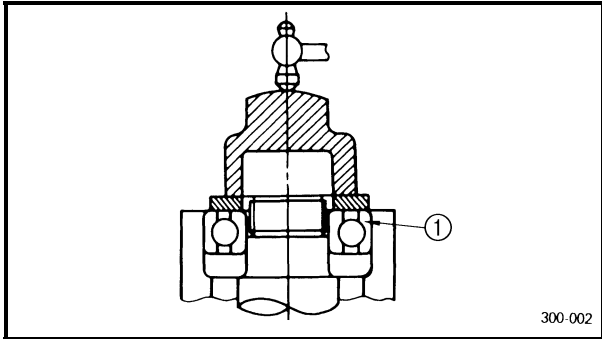
After removal, replace all lock washers/plates ① and cotter pins. After the bolt or nut has been tightened to specification, bend the lock tabs along a flat of the bolt or nut.



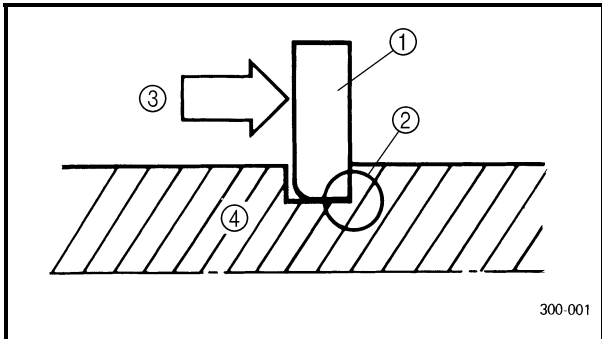
300 000



300-003



300-002



300-001

EBS00017

BEARINGS AND OIL SEALS

Install bearings and oil seals so that the manufacturer's marks or numbers are visible. When installing oil seals, lubricate the oil seal lips with a light coat of lithium-soap-based grease. Oil bearings liberally when installing, if appropriate.

① Oil seal

CAUTION:

Do not spin the bearing with compressed air because this will damage the bearing surfaces.

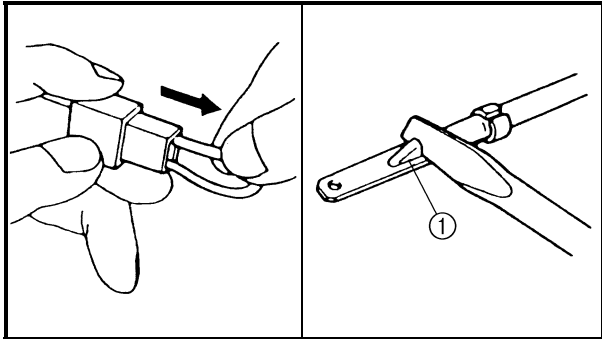
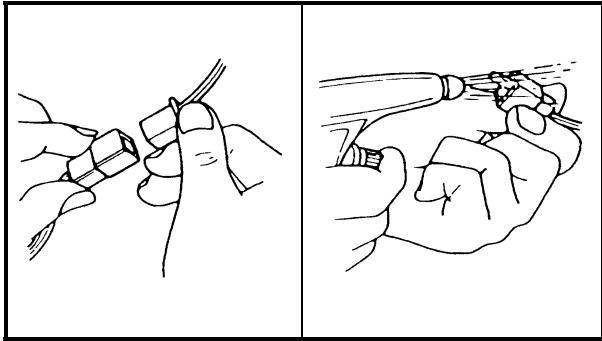
① Bearing

EBS00018

CIRCLIPS

Before reassembly, check all circlips carefully and replace damaged or distorted circlips. Always replace piston pin clips after one use. When installing a circlip ①, make sure the sharp-edged corner ② is positioned opposite the thrust ③ that the circlip receives.

④ Shaft



EBS00019

CHECKING THE CONNECTIONS

Check the leads, couplers, and connectors for stains, rust, moisture, etc.

1. Disconnect:

- lead
- coupler
- connector

2. Check:

- lead
- coupler
- connector

Moisture → Dry with an air blower.

Rust/stains → Connect and disconnect several times.

3. Check:

- all connections

Loose connection → Connect properly.

NOTE: _____

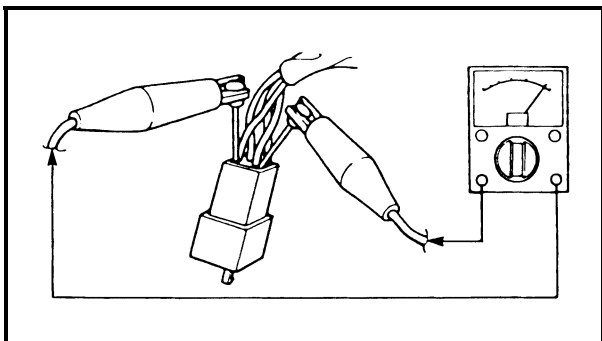
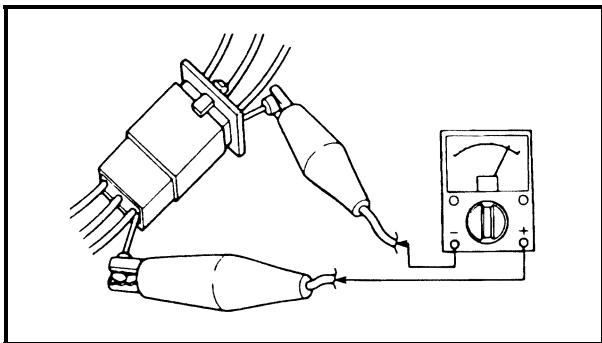
If the pin ① on the terminal is flattened, bend it up.

4. Connect:

- lead
- coupler
- connector

NOTE: _____

Make sure all connections are tight.



5. Check:

- continuity (with the pocket tester)



Pocket tester
YU-03112-C
Analog pocket tester
YU-03112-C

NOTE: _____

- If there is no continuity, clean the terminals.
- When checking the wire harness, perform steps (1) to (3).
- As a quick remedy, use a contact revitalizer available at most part stores.



EBS00021

SPECIAL TOOLS

The following special tools are necessary for complete and accurate tune-up and assembly. Use only the appropriate special tools; this will help prevent damage caused by the use of inappropriate tools or improvised techniques. Special tools may differ by shape and part number from country to country. In such a case, two types are provided.

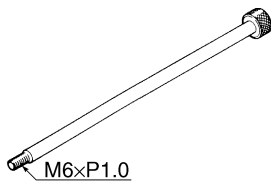

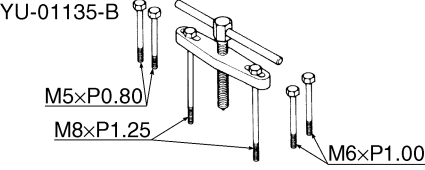
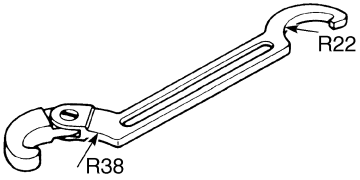
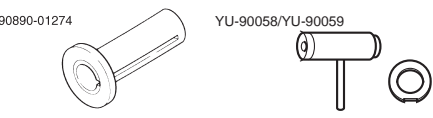
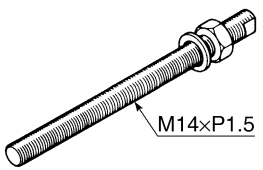
When placing an order, refer to the list provided below to avoid any mistakes.

For US and CAN

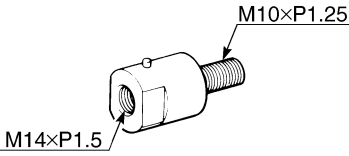
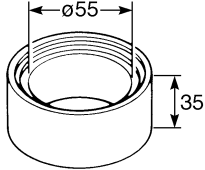
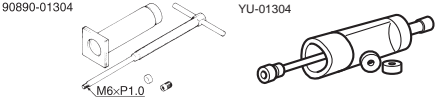
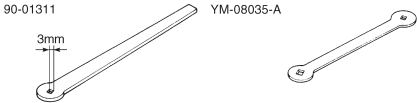
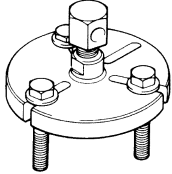
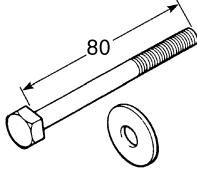
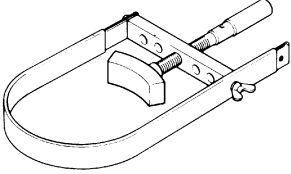
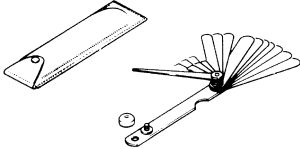
P/N. YM-, YU-, YS-, YK-, ACC-

Except for US and CAN

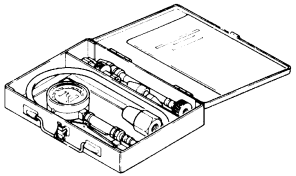
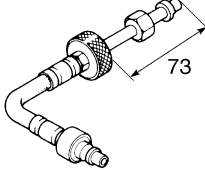
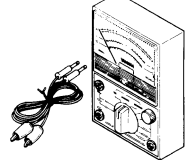
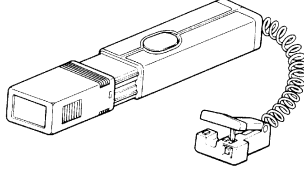
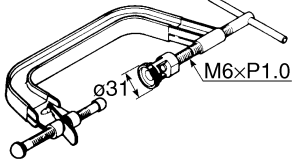
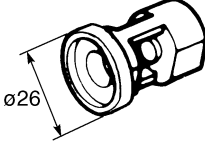
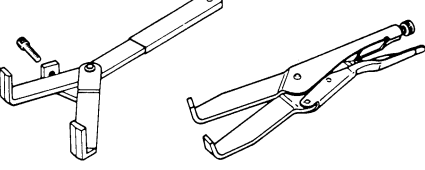
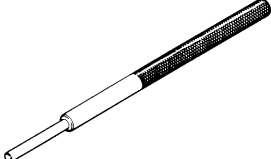
P/N. 90890

Tool No.	Tool name/Function	Illustration
90890-01083 YU-01083-1	Slide hummer bolt Slide hummer bolt 6 mm This tool is used to remove the rocker arm shaft.	
90890-01084 YU-01083-3	Weight This tool is used to remove the rocker arm shaft.	
90890-01135 YU-01135-B	Crankcase separating tool Crankcase separator This tool is used to separate the crankcase.	
90890-01268 YU-01268	Ring nut wrench Spanner wrench This tool is used to adjusting the front shock absorbers.	
90890-01274 YU-90058	Crankshaft installer pot Installing pot These tools are used to install the crankshaft.	
90890-01275 YU-90060	Crankshaft installer bolt Bolt This tool is used to install the crankshaft.	

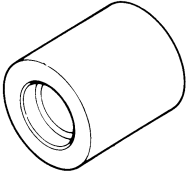
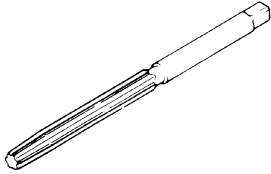
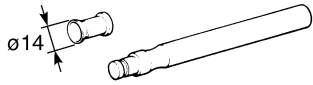

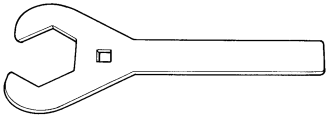
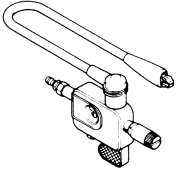

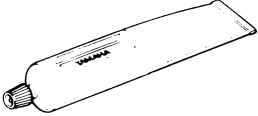


Tool No.	Tool name/Function	Illustration
Adapter 90890-01383 YU-90062	Adapter (M10) Adapter #2 This tool is used to install the crankshaft.	
90890-01288	Spacer This tool is used to install the crankshaft.	
90890-01304 YU-01304	Piston pin puller set Piston pin puller This tool is used to remove the piston pin.	
90890-01311 YM-A5970	Tappet adjusting tool Six piece tappet set This tool is necessary for adjusting the valve clearance.	
90890-01362 YU-33270-B	Flywheel puller Heavy duty puller This tool is used to remove the AC magneto rotor.	
90890-01359	Bolt (M8 × 80 mm) This tool is used to remove the AC magneto rotor.	
90890-01701 YS-01880-A	Sheave holder Primary clutch holder This tool is needed to hold the AC magneto rotor when loosen or tighten the AC magneto rotor nut.	
90890-03079 YM-34483	Thickness gauge Narrow gauge set This tool is used to measure the valve clearance and spark plug gap.	



Tool No.	Tool name/Function	Illustration
90890-03081 YU-33223	Compression gauge Engine compression tester This tool is needed to measure the engine compression.	
90890-04082	Extension This tool is needed to measure engine compression.	
90890-03112 YU-03112-C	Pocket tester Analog pocket tester This instrument is needed for checking the electrical system.	
90890-03141 YU-03141	Timing light Inductive clamp timing light This tool is necessary for checking ignition timing.	
Compressor 90890-04019 YM-04019	Valve spring compressor This tool is needed to remove and install the valve assemblies.	
90890-01243 YM-01253-1	Valve spring compressor attachment Valve spring compressor adapter (26 mm) This tool is needed to remove and install the valve assemblies.	
90890-04086 YM-91042	Universal clutch holder This tool is needed to hold the clutch carrier when removing or installing the carrier nut.	
90890-04064 YM-04064-A	Valve guide remover (φ6) Valve guide remover (6.0 mm) This tool is needed to remove and install the valve guides.	



Tool No.	Tool name/Function	Illustration
90890-04065 YM-04065-A	Valve guide installer ($\phi 6$) Valve guide installer (6.0 mm) This tool is needed to install the valve guides.	
90890-04066 YM-04066	Valve guide reamer ($\phi 6$) Valve guide reamer (6.0 mm) This tool is needed to rebore the new valve guides.	
90890-04101 YM-A8998	Valve lapper Valve lapping tool This tool is needed to remove and install the valve lifters.	
90890-06588	PTT wrench 46 This tool is needed to loosen or tighten the rear axle nut.	
YM-37134	Axle nut wrench (46 mm) This tool is needed to loosen or tighten the rear axle nut.	
90890-06754 YM-34487	Ignition checker Opama pet-4000 spark checker This instrument is necessary for checking the ignition system components.	
90890-06760 YU-39951-B	Digital tachometer This tool is needed for observing engine rpm.	
90890-85505	Yamaha bond No. 1215 (Three Bond No. 1215 [®]) This bond is used on crankcase mating surfaces, etc.	



EBS01001

SPECIFICATIONS

GENERAL SPECIFICATIONS

Item	Standard
Model code	4D31 4D35 4D39
Dimensions Overall length Overall width Overall height Seat height Wheelbase Minimum ground clearance Minimum turning radius	1,625 mm (64.0 in) 1,070 mm (42.1 in) 1,040 mm (40.9 in) 730 mm (28.7 in) 1,110 mm (43.7 in) 100 mm (3.94 in) 2,900 mm (114.2 in)
Basic weight With oil and full fuel tank	150 kg (331 lb)
Engine Engine type Cylinder arrangement Displacement Bore × stroke Compression ratio Engine idle speed Intake vacuum Oil temperature Standard compression pressure (at sea level) Starting system	Air-cooled 4-stroke, SOHC Forward-inclined single cylinder 249 cm ³ (15.19 cu in) 74.0 × 58.0 mm (2.91 × 2.28 in) 9.5 : 1 1,500 ~ 1,600 r/min 34 kPa (255 mmHg, 10.0 inHg) 55 ~ 65 °C 1,100 kPa (11.2 kg/cm ² , 160 psi)/720 r/min Electric starter
Lubrication system	Wet sump
Oil type or grade Engine oil	YAMALUBE4, SAE 5W-30 or SAE 10W-30 or SAE 20W-40 API service, SG type or higher, JASO standard MA
Oil capacity Engine oil Periodic oil change With oil filter replacement Total amount	1.25 L (1.10 Imp qt, 1.32 US qt) 1.35 L (1.19 Imp qt, 1.43 US qt) 1.60 L (1.41 Imp qt, 1.69 US qt)
Air filter	Wet type element



Item	Standard
Fuel Type Fuel tank capacity Fuel reserve amount	Unleaded gasoline only 9.0 L (1.97 Imp gal, 2.37 US gal) 1.0 L (0.22 Imp gal, 0.26 US gal)
Carburetor Type/quantity Manufacturer	BSR29 × 1 MIKUNI
Spark plug Type/manufacturer Spark plug gap	DR7EA/NGK 0.6 ~ 0.7 mm (0.024 ~ 0.028 in)
Clutch type	Wet, multiple-disc
Transmission Primary reduction system Primary reduction ratio Secondary reduction system Secondary reduction ratio Transmission type Operation Gear ratio 1st gear 2nd gear 3rd gear 4th gear 5th gear	Spur gear 76/22 (3.455) Chain drive 38/14 (2.714) Constant mesh, 5-speed Left foot operation 37/13 (2.846) 33/18 (1.833) 29/21 (1.381) 27/24 (1.125) 28/29 (0.966)
Chassis Frame type Caster angle Camber angle Kingpin angle Trail Tread (STD) front rear Toe-in (with tires touching the ground)	Steel tube frame 6° -1.5° 14.8° 23.0 mm (0.91 in) 826 mm (32.52 in) 824 mm (32.44 in) 9 ~ 19 mm (0.35 ~ 0.75 in)
Tire Type Size front rear Manufacturer front rear Type front rear	Tubeless AT20 × 7-10 AT19 × 10-9 DUNLOP DUNLOP KT201 KT205A
Tire pressure (cold tire) Maximum load* Off-road riding front rear *Load in total weight of cargo, rider and accessories	100 kg (220 lb) 27.5 kPa (0.28 kg/cm ² , 4.0 psi) 27.5 kPa (0.28 kg/cm ² , 4.0 psi)

GENERAL SPECIFICATIONS

SPEC

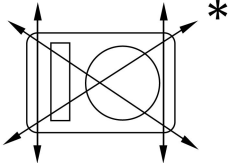
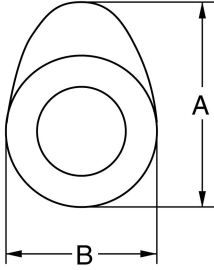
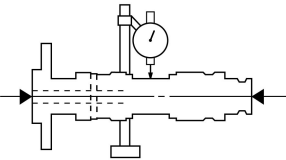


Item	Standard
<p>Brake</p> <p>Front brake type operation</p> <p>Rear brake type operation</p>	<p>Dual disc brake Right hand operation</p> <p>Single disc brake Right foot operation</p>
<p>Suspension</p> <p>Front suspension</p> <p>Rear suspension</p>	<p>Double wishbone</p> <p>Swingarm</p>
<p>Shock absorber</p> <p>Front shock absorber</p> <p>Rear shock absorber</p>	<p>Coil spring/oil damper</p> <p>Coil spring/gas-oil damper</p>
<p>Wheel travel</p> <p>Front wheel travel</p> <p>Rear wheel travel</p>	<p>190 mm (7.48 in)</p> <p>200 mm (7.87 in)</p>
<p>Electrical</p> <p>Ignition system</p> <p>Generator system</p> <p>Battery type</p> <p>Battery capacity</p>	<p>DC-CDI</p> <p>AC magneto</p> <p>YTZ7S</p> <p>12 V 6.0 Ah</p>
<p>Headlight type</p>	<p>Krypton bulb</p>
<p>Bulb voltage/wattage × quantity</p> <p>Headlight</p> <p>Tail/brake light</p> <p>Indicator lights</p> <p>Neutral</p>	<p>12 V 30 W/30 W × 2</p> <p>12 V 5 W/21 W × 1 (4D31)</p> <p>12 V 0.5 W/3.9 W × 1 (4D35, 4D39)</p> <p>12 V 1.7 W × 1</p>



EBS01002

ENGINE SPECIFICATIONS

Item	Standard	Limit
<p>Cylinder head Volume Warp limit *</p> 	<p>20.50 ~ 21.50 cm³ (1.25 ~ 1.31 cu.in) •••</p>	<p>••• 0.05 mm (0.0020 in)</p>
<p>Cylinder Bore size</p>	<p>74.000 ~ 74.016 mm (2.9134 ~ 2.9140 in)</p>	<p>74.100 mm (2.9173 in)</p>
<p>Camshaft Drive method Camshaft lobe dimensions</p>  <p>Intake "A" "B" Exhaust "A" "B"</p> <p>Camshaft runout limit</p> 	<p>Chain drive (Right)</p> <p>36.890 ~ 36.990 mm (1.4524 ~ 1.4563 in) 30.111 ~ 30.211 mm (1.1855 ~ 1.1894 in) 36.891 ~ 36.991 mm (1.4524 ~ 1.4563 in) 30.092 ~ 30.192 mm (1.1847 ~ 1.1887 in)</p> <p>•••</p>	<p>•••</p> <p>36.790 mm (1.4484 in) 30.011 mm (1.1815 in) 36.791 mm (1.4485 in) 29.992 mm (1.1808 in) 0.03 mm (0.0012 in)</p>
<p>Timing chain Timing chain type/No. of links Timing chain adjustment method</p>	<p>DID SCR-0404 SV/104 Automatic</p>	<p>••• •••</p>
<p>Rocker arm/rocker arm shaft Rocker arm inside diameter Rocker arm shaft outside diameter Rocker-arm-to-rocker-arm-shaft clearance</p>	<p>12.000 ~ 12.018 mm (0.4724 ~ 0.4731 in) 11.981 ~ 11.991 mm (0.4717 ~ 0.4721 in) 0.009 ~ 0.037 mm (0.0004 ~ 0.0015 in)</p>	<p>12.036 mm (0.4739 in) 11.950 mm (0.4705 in) •••</p>



Item	Standard	Limit
Valve, valve seat, valve guide		
Valve clearance (cold)	IN 0.05 ~ 0.10 mm (0.0020 ~ 0.0039 in)	•••
	EX 0.10 ~ 0.15 mm (0.0039 ~ 0.0059 in)	•••
Valve dimensions		
Head Diameter	Face Width	Seat Width
		Margin Thickness
"A" head diameter	IN 33.90 ~ 34.10 mm (1.3346 ~ 1.3425 in)	•••
	EX 28.40 ~ 28.60 mm (1.1181 ~ 1.1260 in)	•••
"B" face width	IN 2.26 mm (0.0890 in)	•••
	EX 2.26 mm (0.0890 in)	•••
"C" seat width	IN 0.90 ~ 1.10 mm (0.0354 ~ 0.0433 in)	1.6 mm (0.06 in)
	EX 0.90 ~ 1.10 mm (0.0354 ~ 0.0433 in)	1.6 mm (0.06 in)
"D" margin thickness	IN 0.80 ~ 1.20 mm (0.0315 ~ 0.0472 in)	•••
	EX 0.80 ~ 1.20 mm (0.0315 ~ 0.0472 in)	•••
Stem outside diameter	IN 5.975 ~ 5.990 mm (0.2352 ~ 0.2358 in)	5.945 mm (0.234 in)
	EX 5.960 ~ 5.975 mm (0.2346 ~ 0.2352 in)	5.930 mm (0.233 in)
Guide inside diameter	IN 6.000 ~ 6.012 mm (0.2362 ~ 0.2367 in)	6.050 mm (0.238 in)
	EX 6.000 ~ 6.012 mm (0.2362 ~ 0.2367 in)	6.050 mm (0.238 in)
Stem-to-guide clearance	IN 0.010 ~ 0.037 mm (0.0004 ~ 0.0015 in)	0.080 mm (0.003 in)
	EX 0.025 ~ 0.052 mm (0.0010 ~ 0.0020 in)	0.100 mm (0.004 in)
Valve stem runout	•••	0.01 mm (0.0004 in)
Valve seat width	IN 0.90 ~ 1.10 mm (0.0354 ~ 0.0433 in)	1.6 mm (0.06 in)
	EX 0.90 ~ 1.10 mm (0.0354 ~ 0.0433 in)	1.6 mm (0.06 in)

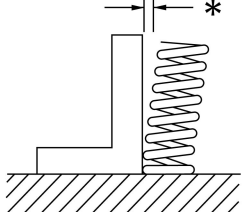
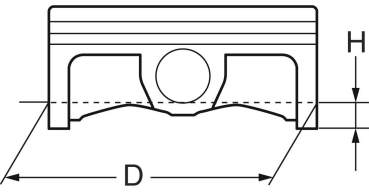
ENGINE SPECIFICATIONS

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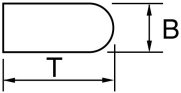
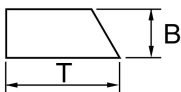
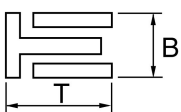
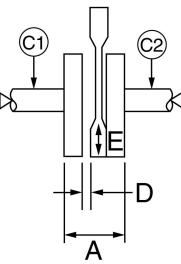


Item	Standard	Limit
Valve spring		
Inner spring		
Free length	IN 36.17 mm (1.42 in)	34.36 mm (1.35 in)
	EX 36.17 mm (1.42 in)	34.36 mm (1.35 in)
Installed length (valve closed)	IN 30.50 mm (1.20 in)	•••
	EX 30.50 mm (1.20 in)	•••
Spring rate K1	IN 14.70 N/mm (1.50 kg/mm, 83.94 lb/in)	•••
K2	IN 19.00 N/mm (1.94 kg/mm, 108.49 lb/in)	•••
K1	EX 14.70 N/mm (1.50 kg/mm, 83.94 lb/in)	•••
K2	EX 19.00 N/mm (1.94 kg/mm, 108.49 lb/in)	•••
Compressed spring force (installed)	IN 75.00 ~ 91.70 N (7.65 ~ 9.35 kg, 16.86 ~ 20.62 lb)	•••
	EX 75.00 ~ 91.70 N (7.65 ~ 9.35 kg, 16.86 ~ 20.62 lb)	•••
Tilt limit *	IN •••	2.5°/1.60 mm (2.5°/0.063 in)
	EX •••	2.5°/1.60 mm (2.5°/0.063 in)
Direction of winding (top view)	IN Counter clockwise	•••
	EX Counter clockwise	•••
Outer spring		
Free length	IN 36.63 mm (1.44 in)	34.80 mm (1.37 in)
	EX 36.63 mm (1.44 in)	34.80 mm (1.37 in)
Installed length (valve closed)	IN 32.00 mm (1.26 in)	•••
	EX 32.00 mm (1.26 in)	•••
Spring rate K1	IN 30.90 N/mm (3.15 kg/mm, 176.44 lb/in)	•••
Spring rate K2	IN 40.80 N/mm (4.16 kg/mm, 232.97 lb/in)	•••
Spring rate K1	EX 30.90 N/mm (3.15 kg/mm, 176.44 lb/in)	•••
Spring rate K2	EX 40.80 N/mm (4.16 kg/mm, 232.97 lb/in)	•••
Compressed spring force (installed)	IN 128.50 ~ 157.90 N (13.10 ~ 16.10 kg, 28.89 ~ 35.50 lb)	•••
	EX 128.50 ~ 157.90 N (13.10 ~ 16.10 kg, 28.89 ~ 35.50 lb)	•••



Item	Standard	Limit
Tilt limit * 	IN EX	••• •••
Direction of winding (top view)	IN EX	••• •••
Piston Piston to cylinder clearance Piston size "D" 	0.010 ~ 0.025 mm (0.0004 ~ 0.0010 in) 73.983 ~ 73.998 mm (2.9127 ~ 2.9133 in)	0.15 mm (0.006 in) •••
Measuring point "H"	5.0 mm (0.20 in)	•••
Piston off set	0.25 mm (0.0098 in)	•••
Offset direction	Intake side	•••
Piston pin bore inside diameter	17.002 ~ 17.013 mm (0.6694 ~ 0.6698 in)	17.043 mm (0.6710 in)
Piston pin outside diameter	16.991 ~ 17.000 mm (0.6689 ~ 0.6693 in)	16.971 mm (0.6681 in)
Piston-pin-to-piston-pin-bore clearance	0.002 ~ 0.022 mm (0.0001 ~ 0.0009 in)	0.072 mm (0.0028 in)



Item	Standard	Limit
Piston rings		
Top ring		
		
Type	Barrel	•••
Dimensions (B × T)	0.90 × 2.75 mm (0.035 × 0.108 in)	•••
End gap (installed)	0.19 ~ 0.31 mm (0.007 ~ 0.012 in)	0.56 mm (0.022 in)
Side clearance	0.030 ~ 0.065 mm (0.0012 ~ 0.0026 in)	0.115 mm (0.0045 in)
2nd ring		
		
Type	Taper	•••
Dimensions (B × T)	0.80 × 2.80 mm (0.031 × 0.110 in)	•••
End gap (installed)	0.30 ~ 0.45 mm (0.012 ~ 0.018 in)	0.80 mm (0.032 in)
Side clearance	0.020 ~ 0.055 mm (0.0008 ~ 0.0022 in)	0.115 mm (0.0045 in)
Oil ring		
		
Dimensions (B × T)	1.50 × 2.60 mm (0.059 × 0.102 in)	•••
End gap (installed)	0.10 ~ 0.35 mm (0.004 ~ 0.014 in)	•••
Crankshaft		
		
Crank width "A"	69.25 ~ 69.30 mm (2.726 ~ 2.728 in)	•••
Runout limit C1	•••	0.03 mm (0.0012 in)
C2	•••	0.03 mm (0.0012 in)
Big end side clearance "D"	0.350 ~ 0.650 mm (0.0138 ~ 0.0256 in)	0.50 mm (0.0197 in)
Big end radial clearance "E"	0.010 ~ 0.025 mm (0.0004 ~ 0.0010 in)	•••

ENGINE SPECIFICATIONS

SPEC



Item	Standard	Limit
Balancer Balancer drive method	Gear	•••
Clutch Friction plate 1 (inside dia.: 104.5 ~ 105.5 mm) Thickness	2.9 ~ 3.1 mm (0.114 ~ 0.122 in)	2.8 mm (0.110 in)
Quantity	4	•••
Friction plate 2 (inside dia.: 104.5 ~ 105.5 mm) Thickness	2.9 ~ 3.1 mm (0.114 ~ 0.122 in)	2.8 mm (0.110 in)
Quantity	2	•••
Clutch plate Thickness	1.5 ~ 1.7 mm (0.059 ~ 0.067 in)	•••
Quantity	5	•••
Max. warpage	•••	0.2 mm (0.0079 in)
Clutch spring Free length	47.8 mm (1.88 in)	45.4 mm (1.79 in)
Quantity	5	•••
Clutch release method	Inner push, cam push	•••
Push rod 2 bending limit	•••	0.1 mm (0.004 in)
Transmission Main axle runout limit	•••	0.06 mm (0.0024 in)
Drive axle runout limit	•••	0.06 mm (0.0024 in)
Main axle assembly width	102.2 ~ 102.4 mm (4.02 ~ 4.03 in)	•••
Shifter Shifter type	Shift drum and guide bar	•••
Max. shift fork guide bar bending	•••	0.05 mm (0.002 in)
Air filter oil grade	Foam air filter oil or equivalent oil	•••

ENGINE SPECIFICATIONS

SPEC



Item	Standard	Limit
Carburetor		
I. D. mark	4D31 00	•••
Main jet (M.J)	#133.8	•••
Main air jet (M.A.J)	#140	•••
Jet needle (J.N)	5DH66-1	•••
Needle jet (N.J)	P-0M	•••
Pilot air jet 1 (P.A.J.1)	#85	•••
Pilot air jet 2 (P.A.J.2)	#170	•••
Pilot outlet (P.O)	ø0.9	•••
Pilot jet (P.J)	#25	•••
Bypass 1 (B.P.1)	ø0.8	•••
Bypass 2 (B.P.2)	ø0.8	•••
Bypass 3 (B.P.3)	ø0.8	•••
Valve seat size (V.S)	ø2.0	•••
Starter jet 1 (G.S.1)	#55	•••
Starter jet 2 (G.S.2)	#0.5	•••
Throttle valve size (THV)	#100	•••
Float height (F.H)	13.0 mm (0.51 in)	•••
Oil filter type	Wire mesh	•••
Oil pump		
Oil pump type	Trochoid	•••
Inner-rotor-to-outer-rotor-tip clearance	0.15 mm (0.0059 in)	0.23 mm (0.0091 in)
Outer-rotor-to-oil-pump-housing clearance	0.100 ~ 0.151 mm (0.0039 ~ 0.0059 in)	0.22 mm (0.0087 in)
Oil-pump-housing-to-inner-and-outer-rotor clearance	0.04 ~ 0.09 mm (0.0016 ~ 0.0035 in)	0.16 mm (0.0063 in)
Oil pressure (hot)	3.0 kPa, 0.03 kg/cm ² , 0.44 psi/1550 r/min	•••
Pressure check location	HEAD CYLINDER	•••



EBS01003

CHASSIS SPECIFICATIONS

Item	Standard	Limit
Front suspension		
Shock absorber travel	90.7 mm (3.57 in)	•••
Spring free length	248.5 mm (9.78 in)	•••
Spring rate	23.0 N/mm (2.34 kg/mm, 131.26 lb/in)	•••
Spring stroke	0.0 ~ 90.7 mm (0.0 ~ 3.57 in)	•••
Optional spring	No	•••
Rear suspension		
Shock absorber assembly travel	87.0 mm (3.43 in)	•••
Spring free length	240.5 mm (9.47 in)	•••
Spring rate	54.0 N/mm (5.50 kg/mm, 308.18 lb/in)	•••
Stroke	0 ~ 87.0 mm (0 ~ 3.43 in)	•••
Optional spring	No	•••
Swingarm		
Free play limit	radial	•••
	axial	•••
		1.0 mm (0.04 in) 1.0 mm (0.04 in)
Rear axle		
Rear axle runout		•••
		1.5 mm (0.06 in)
Front wheel		
Type	Panel wheel	•••
Rim size	10 × 5.5 AT	•••
Rim material	Aluminum	•••
Rim runout limit	radial	•••
	lateral	•••
		2.0 mm (0.08 in) 2.0 mm (0.08 in)
Rear wheel		
Type	Panel wheel	•••
Rim size	9 × 8.5 AT	•••
Rim material	Aluminum	•••
Rim runout limit	radial	•••
	lateral	•••
		2.0 mm (0.08 in) 2.0 mm (0.08 in)
Drive chain		
Type/manufacturer	520V/DAIDO	•••
Link quantity	91	•••
Drive chain slack	45.0 ~ 55.0 mm (1.77 ~ 2.17 in)	•••
Maximum 15-links section	239.3 mm (9.42 in)	•••

CHASSIS SPECIFICATIONS

SPEC



Item	Standard	Limit
Front disc brake		
Type	Dual	•••
Disc outside diameter × thickness	161.0 × 3.5 mm (6.34 × 0.14 in)	3.0 mm (0.12 in)
Brake disk maximum deflection		0.15 mm (0.006 in)
Pad thickness inner	4.4 mm (0.17 in)	1.5 mm (0.06 in)
Pad thickness outer	4.5 mm (0.18 in)	1.5 mm (0.06 in)
Master cylinder inside diameter	12.7 mm (0.50 in)	•••
Caliper cylinder inside diameter	27 mm (1.06 in)	•••
Brake fluid type	DOT 4	•••
Rear disc brake		
Type	Single	•••
Disc outside diameter × thickness	200.0 × 4.0 mm (7.87 × 0.16 in)	3.5 mm (0.14 in)
Brake disk maximum deflection		0.15 mm (0.006 in)
Pad thickness inner	4.2 mm (0.17 in)	1.0 mm (0.04 in)
Pad thickness outer	4.2 mm (0.17 in)	1.0 mm (0.04 in)
Master cylinder inside diameter	12.7 mm (0.50 in)	•••
Caliper cylinder inside diameter	33.96 mm (1.34 in)	•••
Brake fluid type	DOT 4	•••
Lever and pedal		
Brake lever free play	0 mm (0 in)	•••
Brake pedal position (top of the brake pedal to top of the frame)	40.0 mm (1.57 in)	•••
Parking brake cable end length	64 ~ 68 mm (2.52 ~ 2.68 in)	•••
Clutch lever free play (lever end)	5 ~ 10 mm (0.20 ~ 0.39 in)	•••
Throttle lever free play	2 ~ 4 mm (0.08 ~ 0.16 in)	•••
Speed limiter length	Less than 12 mm (0.47 in)	•••
Shift pedal height	15.2 mm (0.60 in)	•••



EBS01004

ELECTRICAL SPECIFICATIONS

Item	Standard	Limit
Voltage	12 V	•••
Ignition system		
Ignition timing (B.T.D.C.)	10.0°/1,550 r/min	•••
Advanced timing (B.T.D.C.)	24.4°/5,000 r/min	•••
Advancer type	Digital type	•••
CDI		
CDI unit model/manufacturer	4D3/YAMAHA	•••
Pickup coil resistance/color	248 ~ 372 Ω at 20°C (68°F) red–white	•••
Ignition coil		
Model/manufacturer	2JN/YAMAHA	•••
Minimum ignition spark gap	6.0 mm (0.24 in)	•••
Primary winding resistance	0.18 ~ 0.28 Ω at 20°C (68°F)	•••
Secondary winding resistance	6.32 ~ 9.48 k Ω at 20°C (68°F)	•••
Spark plug cap		
Material	Resin	
Resistance	10.0 k Ω	
Charging system		
Type	AC magneto	•••
Model/manufacturer	F5XT/YAMAHA	•••
Nominal output	14 V 190 W at 5,000 r/min	•••
Charging coil resistance/color	0.688 ~ 1.032 Ω at 20°C (68°F) white–white	•••
Rectifier/regulator		
Type	Semi conductor-short circuit	•••
Model/manufacturer	SH640E-11/SHINDENGEN	•••
No load regulated voltage (DC)	14.1 ~ 14.9 V	•••
Rectifier capacity (DC)	14.0 A	•••
Withstand voltage	200.0 V	
Battery		
Specific gravity	1.310	
Electric starter system		
Type	Constant mesh type	•••
Starter motor		
Model/manufacturer	4D3/YAMAHA	•••
Output	0.40 kW	•••
Armature coil resistance	0.013 ~ 0.015 Ω at 20°C (68°F)	•••
Brush overall length	10.0 mm (0.39 in)	3.5 mm (0.14 in)
Spring force	5.52 ~ 8.28 N (563 ~ 844 gf, 19.85 ~ 29.78 oz)	•••
Commutator diameter	22.0 mm (0.87 in)	21.0 mm (0.83 in)
Mica undercut	1.5 mm (0.06 in)	•••

ELECTRICAL SPECIFICATIONS

SPEC



Item	Standard	Limit
Starter relay		
Model/manufacturer	A4616-051/JIDECO	•••
Amperage rating	180 A	•••
Coil winding resistance	4.18 ~ 4.62 Ω	•••
Headlight relay		
Headlight relay		
Model/manufacturer	G8HN-1C4T-DJ-Y52/OMRON	•••
Coil resistance	94.5 Ω ~ 115.5 Ω	•••
Circuit breaker		
Type	Fuse	•••
Amperage for individual circuit		
Fuse	15 A × 1	•••
Reserve	15 A × 1	•••



EBS01005

TIGHTENING TORQUES
ENGINE TIGHTENING TORQUES

Part to be tightened	Part name	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m•kg	ft•lb	
Cylinder head (upper)	Bolt	M8	4	24	2.4	18	
				See NOTE *1			
Cylinder head	Bolt	M8	2	20	2.0	15	
Camshaft lock plate	Bolt	M6	2	8	0.8	5.9	
Cylinder head side cover (1 and 2)	Bolt	M5.5	2	18	1.8	13	
Cylinder head side cover 3	Bolt	M6	2	10	1.0	7.4	
Cylinder head breather plate	Bolt	M6	2	10	1.0	7.4	
Spark plug	—	M12	1	18	1.8	13	
Cylinder head stud bolt	Stud bolt	M8	2	15	1.5	11	
Oil gallery bolt	Bolt	M6	1	7	0.7	5.2	
Carburetor joint	Bolt	M6	2	10	1.0	7.4	
Plate, 2	Bolt	M6	2	12	1.2	8.9	
Cylinder	Bolt	M6	2	10	1.0	7.4	
Left crankcase cover	Bolt	M6	9	10	1.0	7.4	
Pickup coil rotor	Bolt	M10	1	60	6.0	44	
Balancer weight gear	Nut	M12	1	55	5.5	41	Use a lock washer.
Valve clearance adjusting locknut	Nut	M6	2	14	1.4	10	
Camshaft sprocket	Bolt	M10	1	60	6.0	44	
Timing chain tensioner	Bolt	M6	2	10	1.0	7.4	
Timing chain tensioner cap bolt	Bolt	M6	1	8	0.8	5.9	
Timing chain guide (intake side)	Bolt	M6	2	8	0.8	5.9	
Oil filter element cover	Bolt	M6	3	10	1.0	7.4	
Oil delivery pipe	Union bolt	M10	1	20	2.0	15	
Oil delivery pipe and cylinder	Union bolt	M8	1	17	1.7	13	
Oil pump assembly	Screw	M6	3	6	0.6	4.4	
Carburetor joint clamp screw (front)	Screw	M4	2	4	0.4	3.0	
Carburetor joint clamp screw (rear)	Screw	M4	1	4	0.4	3.0	
Exhaust pipe nut	Nut	M8	2	18	1.8	13	
Muffler joint	Bolt	M8	1	20	2.0	15	
Muffler	Bolt	M8	2	34	3.4	25	
Left crankcase cover	Bolt	M5	1	7	0.7	5.2	
Right crankcase cover	Bolt	M6	13	10	1.0	7.4	
Crankcase	Bolt	M6	12	10	1.0	7.4	
Oil drain bolt	Bolt	M12	1	20	2.0	15	
Ground lead, clutch cable holder	Bolt	M6	1	10	1.0	7.4	
Neutral switch lead clamp	Bolt	M6	1	10	1.0	7.4	
Starter idle gear cover	Bolt	M6	3	10	1.0	7.4	
Starter clutch	Bolt	M8	3	30	3.0	22	
Primary drive gear nut	Nut	M16	1	80	8.0	59	Use a lock washer.

TIGHTENING TORQUES

SPEC



Part to be tightened	Part name	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m•kg	ft•lb	
Clutch boss nut	Nut	M16	1	75	7.5	55	Use a lock washer.
Clutch spring	Screw	M6	5	8	0.8	5.9	
Push lever adjusting screw locknut	Nut	M6	1	8	0.8	5.9	
Push lever shaft	Bolt	M8	1	12	1.2	8.9	
Chain case cover	Bolt	M10	2	10	1.0	7.4	
Drive sprocket nut	Nut	M18	1	110	11.0	81	
Stopper lever	Bolt	M6	1	10	1.0	7.4	
Shift pedal	Bolt	M6	1	10	1.0	7.4	
Neutral switch	—	M10	1	20	2.0	15	
Starter motor	Bolt	M6	2	10	1.0	7.4	
Stator coil	Bolt	M6	3	10	1.0	7.4	
Pickup coil	Bolt	M6	2	10	1.0	7.4	

NOTE:

*1: Apply oil to the bearing surface of (upper) cylinder head bolt.
Further, apply molybdenum disulfide grease to thread part.



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CHASSIS TIGHTENING TORQUES






Part to be tightened	Thread size	Tightening torque			Remarks
		Nm	m•kg	ft•lb	
Engine upper stay and frame	M8	33	3.3	24	Use a lock washer.
Engine upper stay and engine	M10	66	6.6	49	
Engine lower stay and engine	M10	40	4.0	30	
Engine and frame	M10	66	6.6	49	
Engine lower stay and frame	M8	33	3.3	24	
Swingarm pivot shaft and frame	M14	100	10	74	
Rear shock absorber and frame	M12	55	5.5	41	
Rear shock absorber locknut	M20	42	4.2	31	
Rear axle pinch bolt	M8	21	2.1	15	
Front shock absorber and frame	M10	48	4.8	35	
Front shock absorber and lower front arm	M10	48	4.8	35	
Upper front arm and frame	M10	45	4.5	33	
Lower front arm and frame	M10	45	4.5	33	
Steering stem and frame	M10	35	3.5	26	
Steering stem bushing and frame	M8	23	2.3	17	
Steering stem and handlebar holder	M8	20	2.0	15	
Tie-rod end and locknut	M10	15	1.5	11	
Steering knuckle and front wheel hub	M14	70	7.0	52	
Steering knuckle and front arm (upper and lower)	M10	25	2.5	18	
Steering knuckle and tie-rod ball joint	M10	25	2.5	18	
Steering stem and tie-rod ball joint	M10	25	2.5	18	
Fuel tank and fuel cock	M6	4	0.4	3.0	
Fuel tank and frame	M6	7	0.7	5.2	
Front wheel and front wheel hub	M10	45	4.5	33	
Steering knuckle and front brake caliper bracket	M8	28	2.8	21	
Front brake disc and front wheel hub	M8	28	2.8	21	
Rear axle and rear wheel hub	M14	120	12	89	
Rear brake caliper and brake caliper bracket	M8	34	3.4	25	
Rear wheel and rear wheel hub	M10	45	4.5	33	
Driven sprocket and sprocket bracket	M10	55	5.5	41	
Front brake pipe nut	M10	19	1.9	14	
Front brake master cylinder and handlebar	M6	7	0.7	5.2	
Clutch lever holder and handlebar	M5	4	0.4	3.0	
Parking brake assembly and clutch lever holder	M6	7	0.7	5.2	



TIGHTENING TORQUES

SPEC



Part to be tightened	Thread size	Tightening torque			Remarks	
		Nm	m•kg	ft•lb		
Front brake master cylinder and brake lever	M6	6	0.6	4.4		
Throttle assembly and handlebar	M5	4	0.4	3.0		
Front brake master cylinder and brake hose	M10	27	2.7	20		
Brake hose joint and frame	M6	10	1.0	7.4		
Bleed screw	M8	5	0.5	3.7		
Front brake pad retaining bolt	M10	17	1.7	13		
Front brake caliper and brake hose	M10	27	2.7	20		
Rear brake caliper retaining bolt	M8	17	1.7	13		
Parking brake case and caliper	M8	22	2.2	16		  
Rear axle ring nut	M33	140	14	103		
Rear axle ring nut set bolt	M6	7	0.7	5.2		
Rear brake pad retaining bolt	M8	17	1.7	13		Use a lock washer.
Rear brake caliper and brake hose	M10	31	3.1	23		
Rear brake master cylinder and frame	M8	20	2.0	15		
Rear brake master cylinder and brake hose	M10	31	3.1	23		
Parking brake adjusting bolt and locknut	M8	15	1.5	11		
Rear brake disc and brake disc bracket	M8	28	2.8	21		
Rear brake fluid reservoir, cover and bracket	M6	7	0.7	5.2		
Front bumper and frame	M8	31	3.1	23		
Front fender stay and frame	M6	7	0.7	5.2		
Side cover and frame	M6	7	0.7	5.2		
Rear fender and frame	M6	7	0.7	5.2		
Rear fender, air filter case and frame	M6	7	0.7	5.2		
Rear fender and rear fender stay	M6	7	0.7	5.2		
Front fender stay and front fender	M6	7	0.7	5.2		
Rear carrier bar and frame	M8	31	3.1	23		
Footrest and frame	M10	73	7.3	54		
Foot protector stay foot protector	M6	7	0.7	5.2		
Foot protector stay foot protector	M5	6	0.6	4.4		
Foot protector stay and frame	M8	17	1.7	13		
Foot protector stay and footrest	M8	17	1.7	13		
Battery cover, air filter case and frame	M6	7	0.7	5.2		
Headlight and frame	M6	7	0.7	5.2		
Tail/brake light bracket and air filter case	M6	4	0.4	3.0		
Drive chain guide roller and frame	M8	23	2.3	17		
Engine skid plate and frame	M6	7	0.7	5.2		

HOW TO USE THE CONVERSION TABLE/ GENERAL TIGHTENING TORQUE SPECIFICATIONS

SPEC



EBS00022

HOW TO USE THE CONVERSION TABLE

All specification data in this manual are listed in SI and METRIC UNITS.

Use this table to convert METRIC unit data to IMPERIAL unit data.

Ex.

METRIC	×	MULTIPLIER	=	IMPERIAL
** mm	×	0.03937	=	** in
2 mm	×	0.03937	=	0.08 in

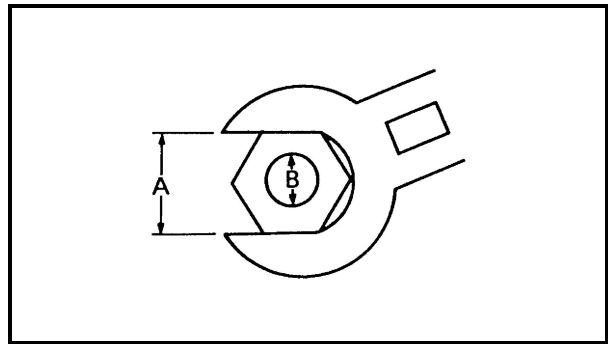
CONVERSION TABLE

METRIC TO IMPERIAL			
	Metric unit	Multiplier	Imperial unit
Torque	m•kg	7.233	ft•lb
	m•kg	86.794	in•lb
	cm•kg	0.0723	ft•lb
	cm•kg	0.8679	in•lb
Weight	kg	2.205	lb
	g	0.03527	oz
Speed	km/hr	0.6214	mph
Distance	km	0.6214	mi
	m	3.281	ft
	m	1.094	yd
	cm	0.3937	in
	mm	0.03937	in
Volume/ Capacity	cc (cm ³)	0.03527	oz (IMP liq.)
	cc (cm ³)	0.06102	cu•in
	lt (liter)	0.8799	qt (IMP liq.)
Misc.	lt (liter)	0.2199	gal (IMP liq.)
	kg/mm	55.997	lb/in
	kg/cm ²	14.2234	psi (lb/in ²)
	Centigrade (°C)	9/5+32	Fahrenheit (°F)

EBS00023

GENERAL TIGHTENING TORQUE SPECIFICATIONS

This chart specifies tightening torques for standard fasteners with a standard ISO thread pitch. Tightening torque specifications for special components or assemblies are provided for each chapter of this manual. To avoid warpage, tighten multi-fastener assemblies in a crisscross pattern and progressive stages until the specified tightening torque is reached. Unless otherwise specified, tightening torque specifications require clean, dry threads. Components should be at room temperature.



A: Distance between flats

B: Outside thread diameter

A (nut)	B (bolt)	General tightening torques		
		Nm	m•kg	ft•lb
10 mm	6 mm	6	0.6	4.3
12 mm	8 mm	15	1.5	11
14 mm	10 mm	30	3.0	22
17 mm	12 mm	55	5.5	40
19 mm	14 mm	85	8.5	61
22 mm	16 mm	130	13.0	94



EBS00024

LUBRICATION POINTS AND LUBRICANT TYPES

ENGINE

Lubrication point	Lubricant
Oil seal lips	
O-rings	
Bearings	
Cylinder head bolts (bearing surface of bolts)	
Cylinder head bolts (thread part)	
Cylinder body surface	
Crankshaft journals	
Connecting rod small end and big end	
Piston pin	
Piston surface	
Boss periphery	
Valve stems (intake and exhaust)	
Valve stem ends (intake and exhaust)	
Rocker arm shafts (intake and exhaust)	
Camshaft	
Valve rocker arms	
Oil pump rotors (inner and outer) and oil pump housing and shaft	
Starter idler gears 1	
Starter idler gears 2	
Starter wheel gear	
Push rods	
Clutch housing (primary driven gear)	
Push lever shaft	
Push rod ball	
Drive axle	
Main axle	
Transmission gears (inside and end)	
Shift fork guide bar	
Shift drum	
Shift shaft	

LUBRICATION POINTS AND LUBRICANT TYPES

SPEC



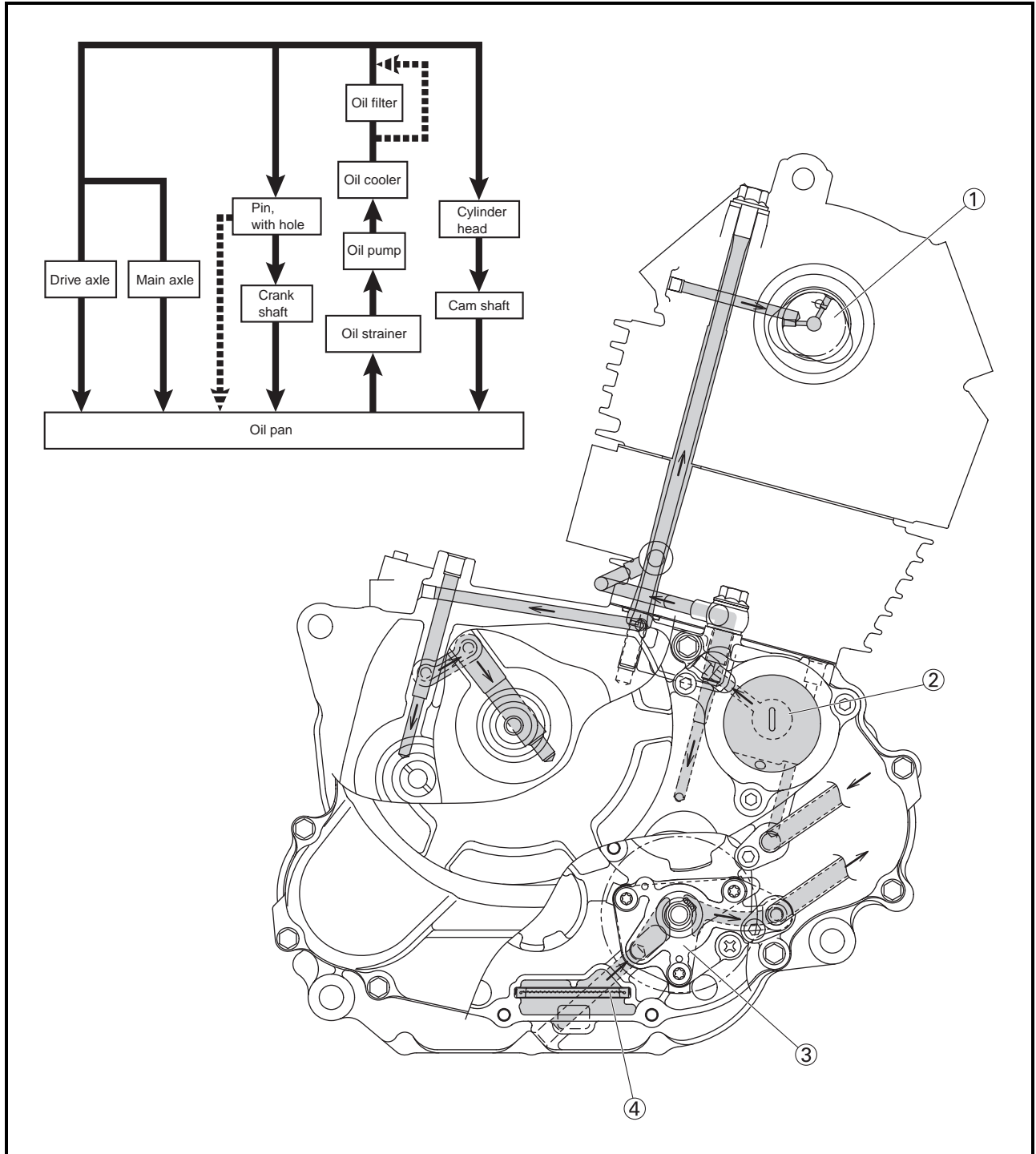
Lubrication point	Lubricant
Crankcase mating surfaces	Sealant (Three Bond No.1215 [®]) Yamaha bond No.1215
AC magneto lead grommet (AC magneto cover)	Sealant (Three Bond No.1215 [®]) Yamaha bond No.1215



EBS00026

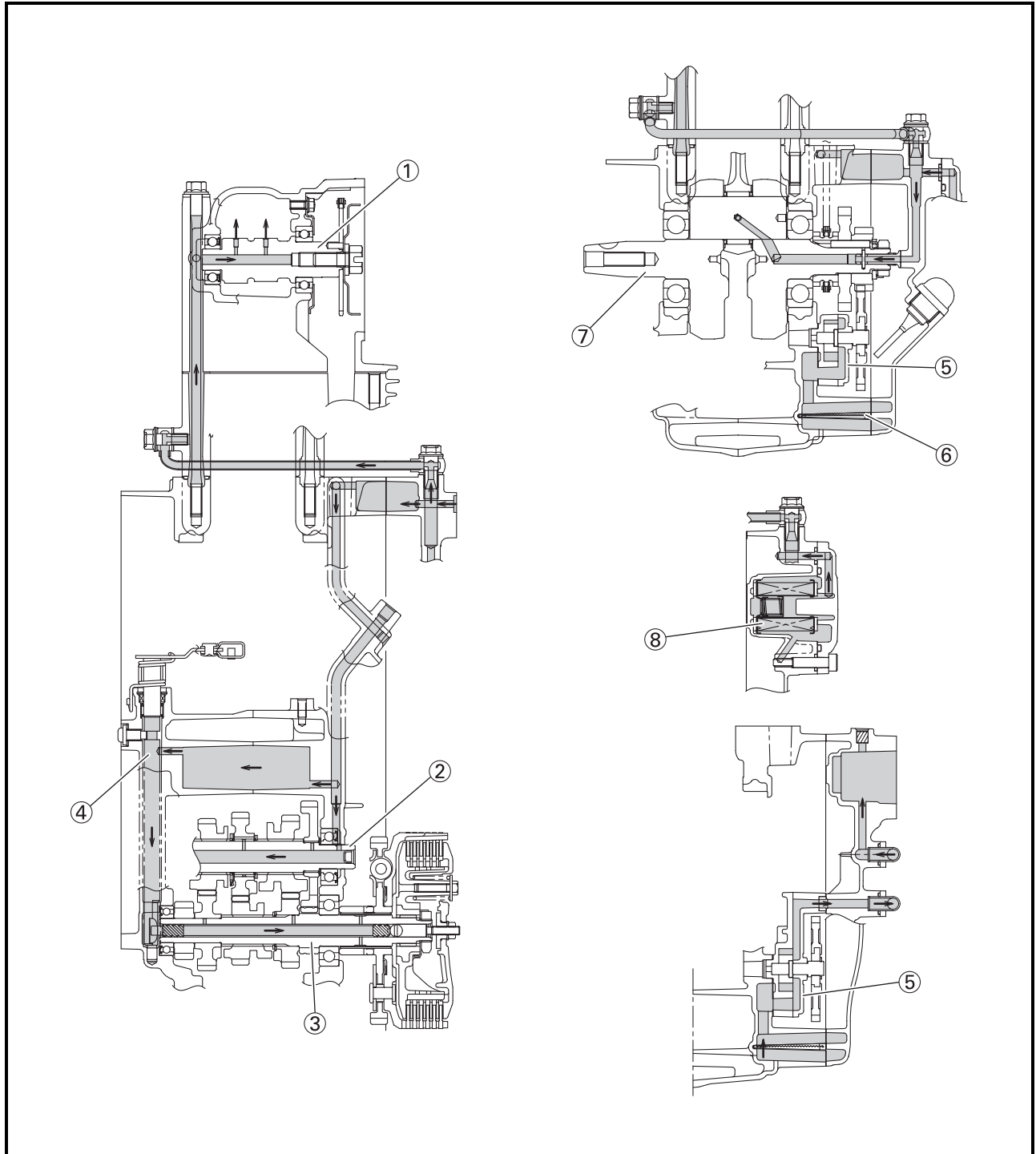
OIL FLOW DIAGRAMS

- ① Camshaft
- ② Oil filter element
- ③ Oil pump
- ④ Oil strainer



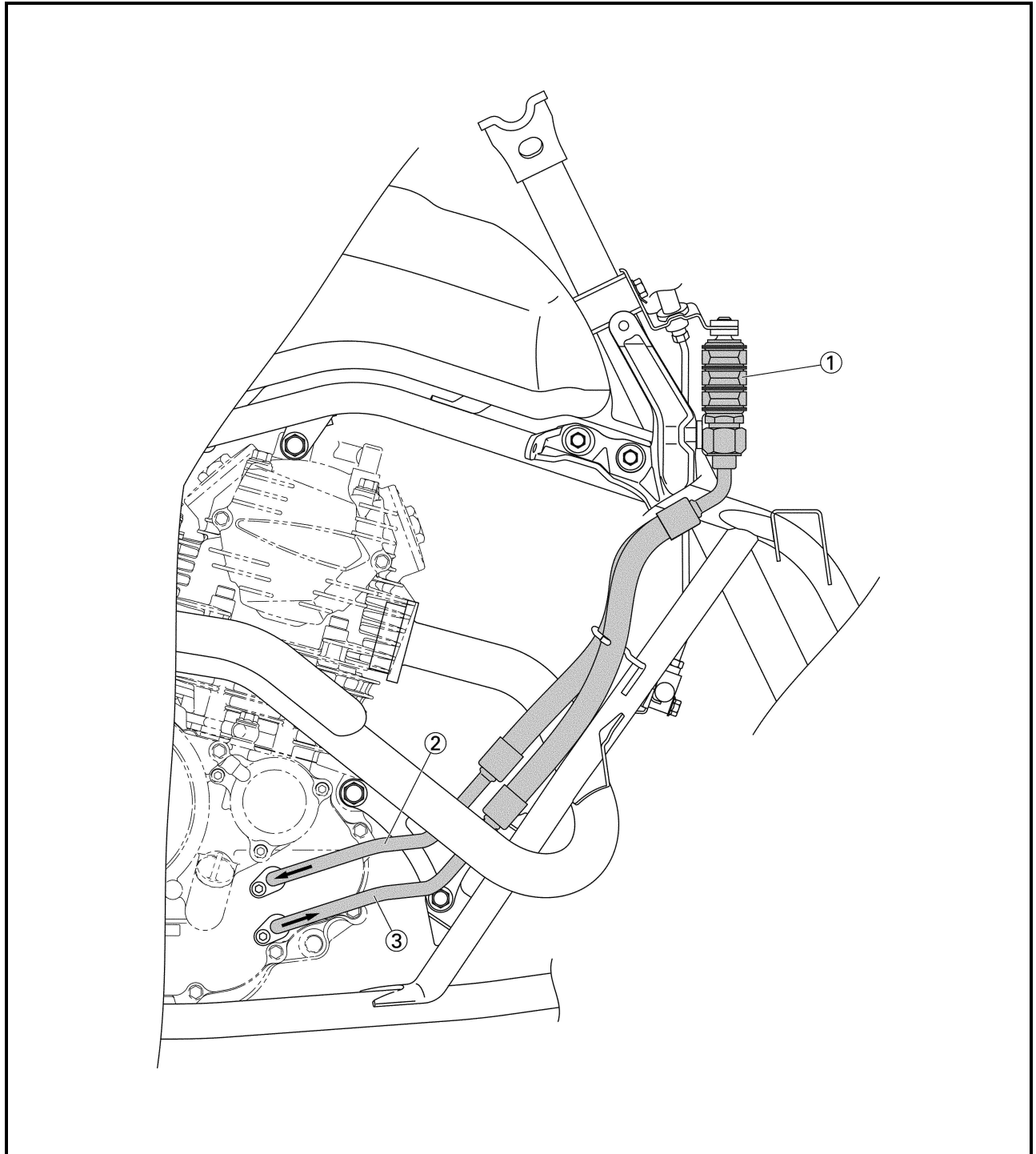


- ① Camshaft
- ② Drive axle
- ③ Main axle
- ④ Push lever shaft
- ⑤ Oil pump assembly
- ⑥ Oil strainer
- ⑦ Crankshaft assembly
- ⑧ Oil filter element





- ① Oil cooler
- ② Oil hose 1
- ③ Oil hose 2

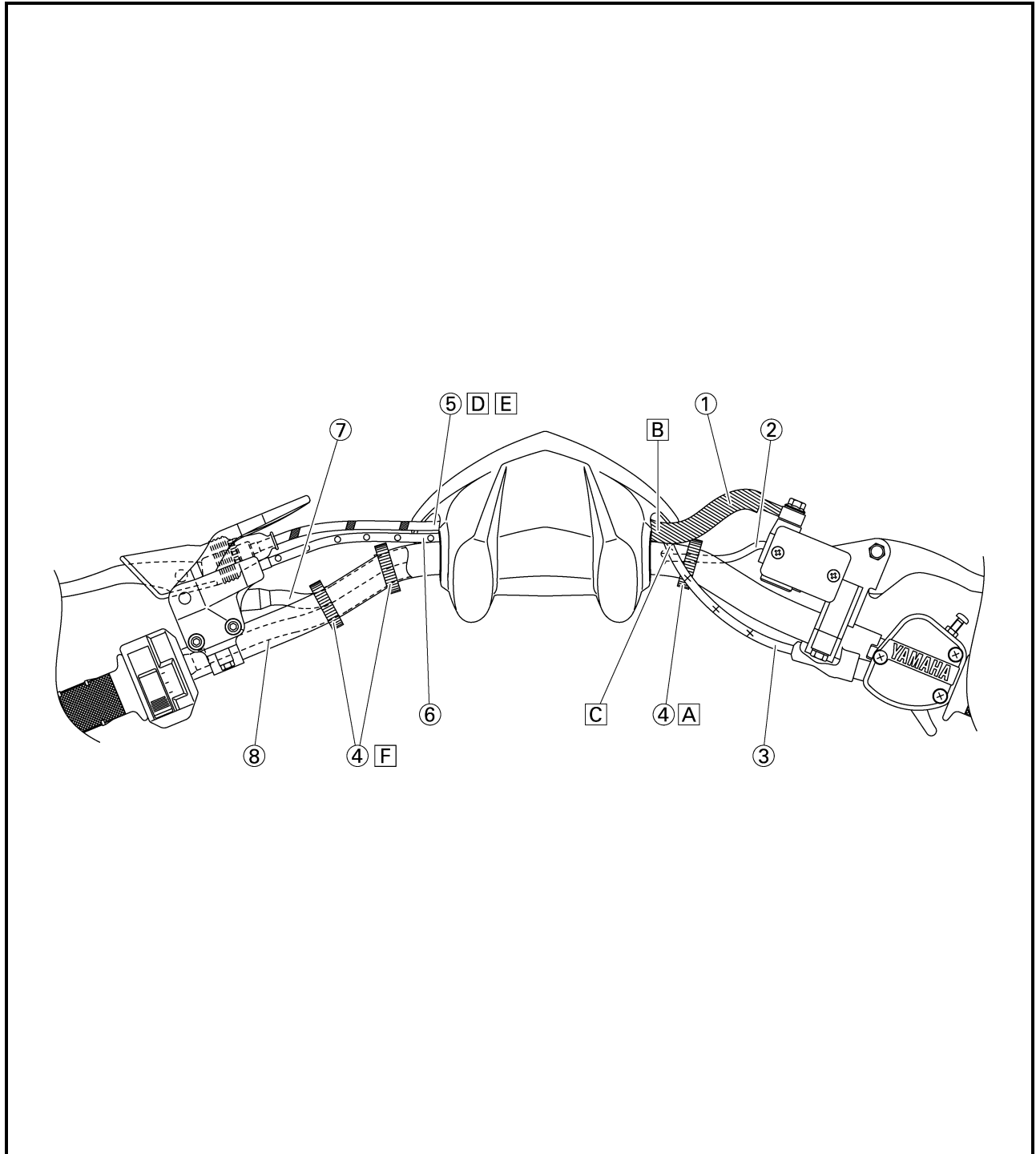




EBS00028

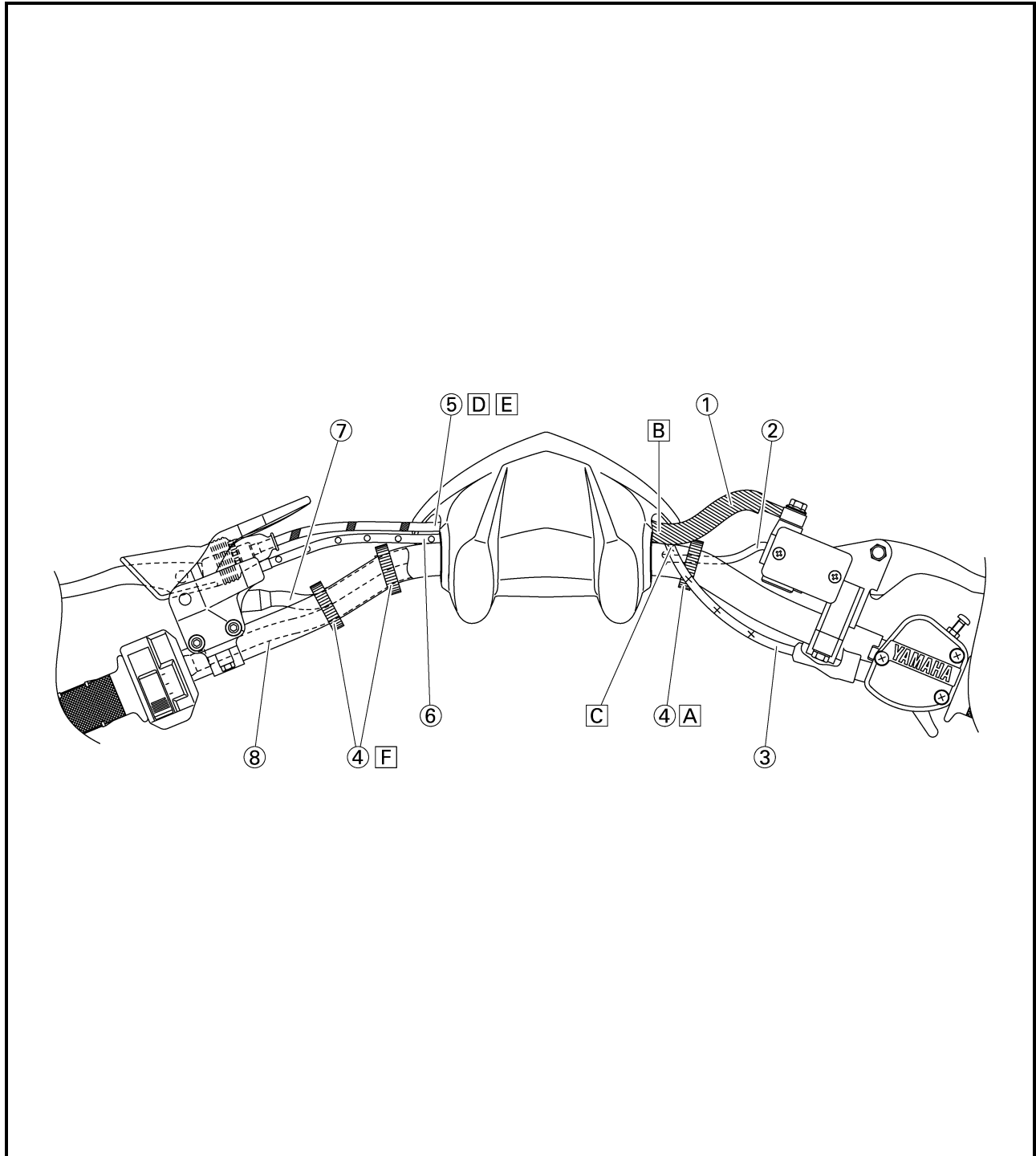
CABLE ROUTING

- ① Front brake hose
- ② Front brake light switch lead
- ③ Throttle cable
- ④ Plastic band
- ⑤ Clutch cable
- ⑥ Parking brake cable
- ⑦ Clutch switch lead
- ⑧ Handlebar switch lead



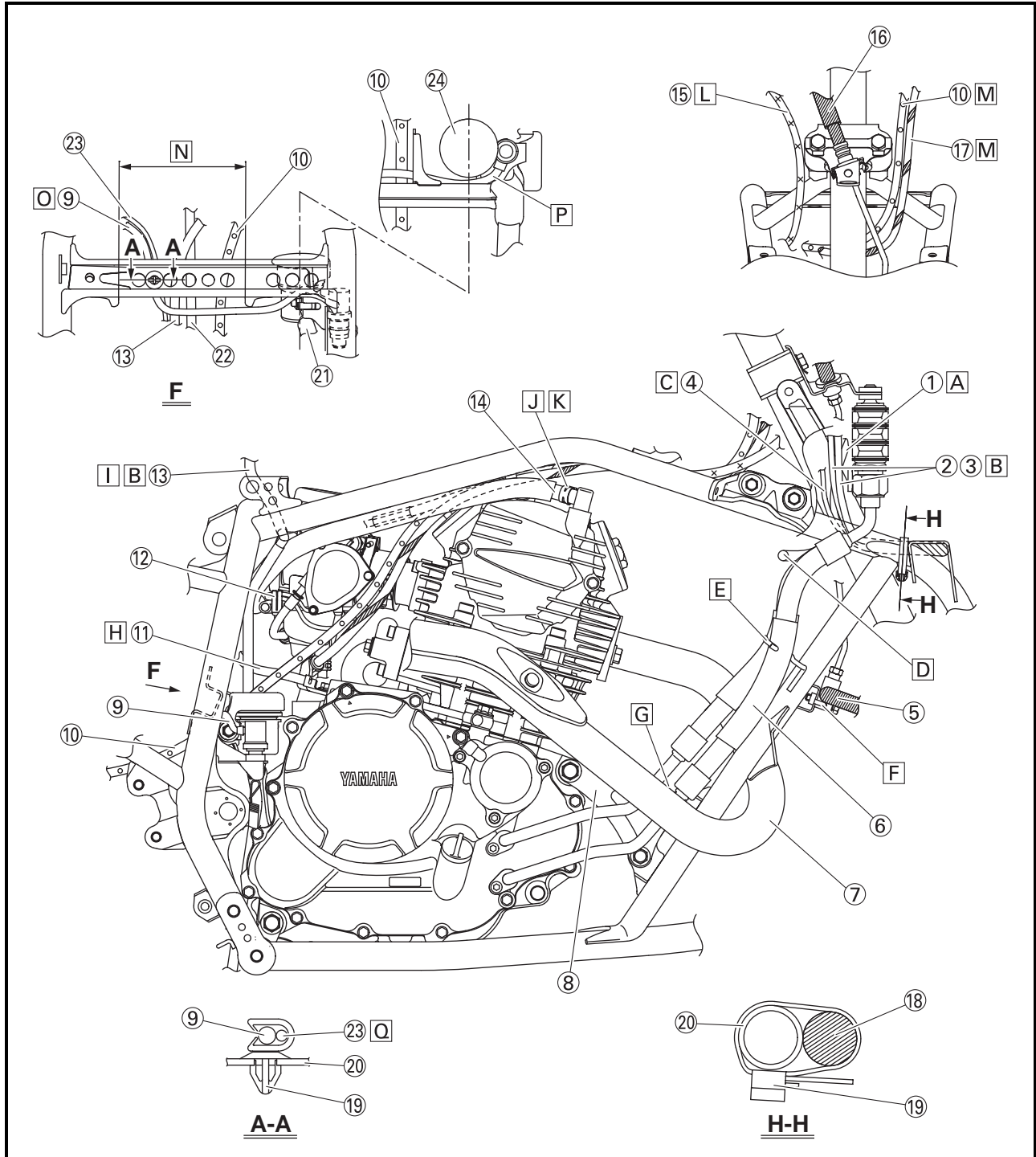


- A** Clamp the front brake light switch lead at the bends of handlebar.
- B** Route the front brake hose and throttle cable through the guide of the handlebar protector.
- C** Route the throttle cable under the front brake hose.
- D** Route the clutch cable and parking brake cable through the guide of the handlebar protector.
- E** Route the clutch cable in front of the parking brake cable.
- F** Clamp the clutch switch lead and handlebar switch lead at the bends of handlebar.



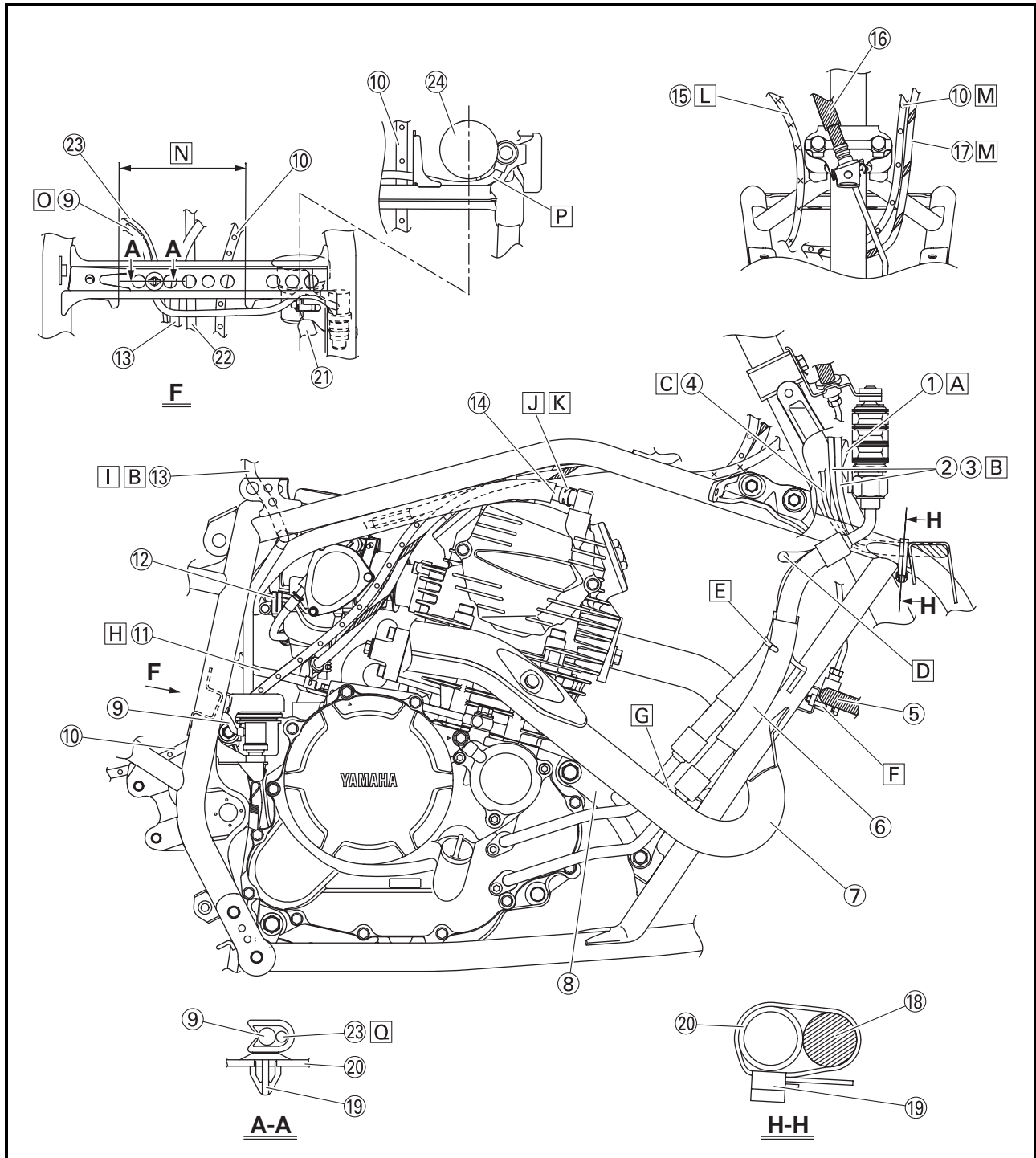


- | | | |
|---------------------------------|---------------------------------|------------------------------|
| ① Indicator light lead | ⑫ Carburetor warmer lead | ⑳ Neutral switch lead |
| ② Main switch lead | ⑬ Air vent hose | ㉑ Rear brake reservoir cover |
| ③ Coupler joint | ⑭ Air filter case breather hose | |
| ④ Front brake light switch lead | ⑮ Throttle cable | |
| ⑤ Front brake hose 2 | ⑯ Front brake hose 1 | |
| ⑥ Oil cooler hose 1, 2 | ⑰ Clutch cable | |
| ⑦ Exhaust pipe | ⑱ Main harness | |
| ⑧ Engine bracket | ㉒ Clamp | |
| ⑨ Rear brake light switch lead | ㉓ Frame complete | |
| ⑩ Parking brake cable | ㉔ Rear brake reservoir hose | |
| ⑪ Battery negative lead | ㉕ Carburetor overflow hose | |



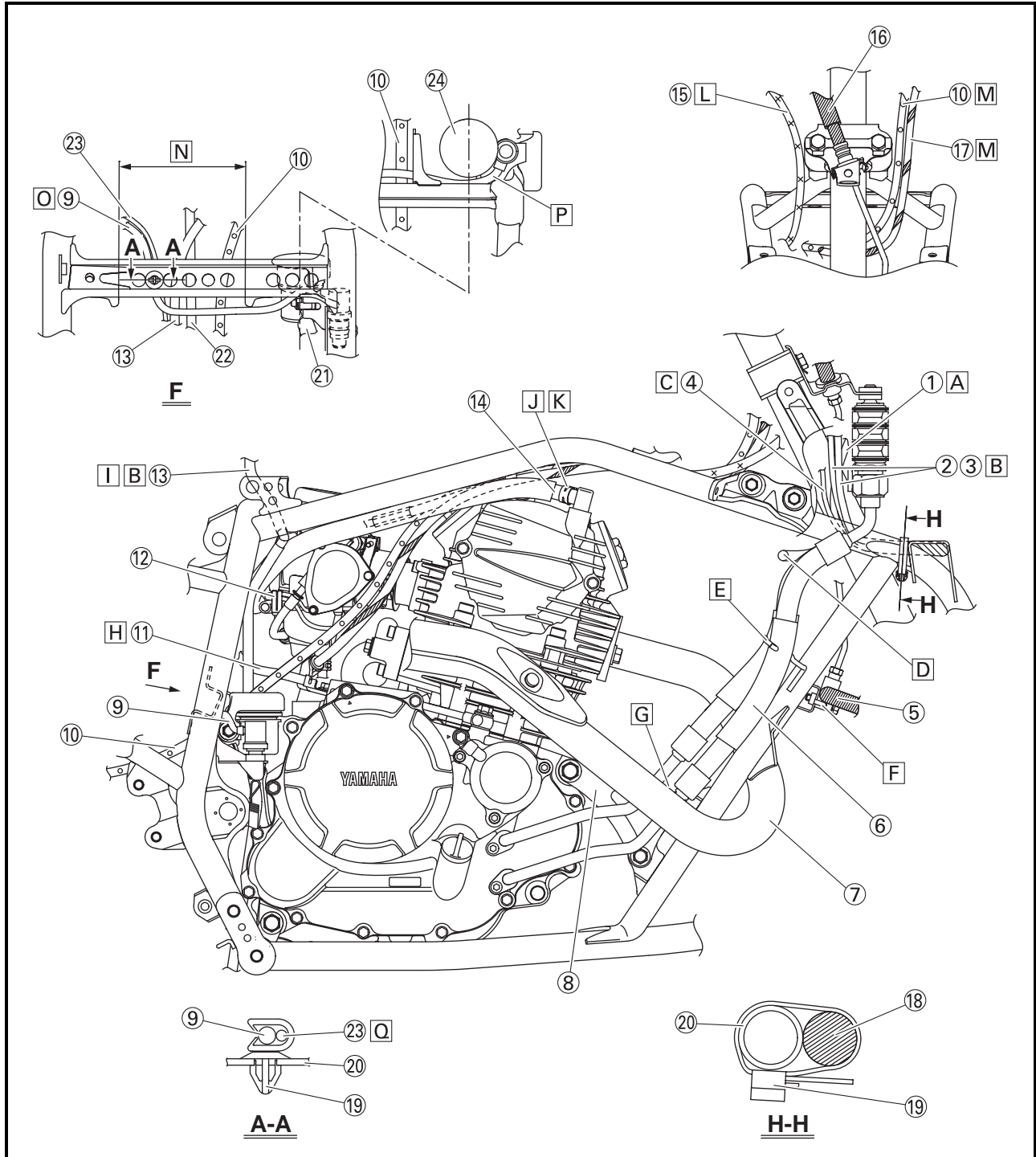


- A** To the front panel
- B** To the front fender
- C** To the handlebar
- D** To the right headlight
- E** Make sure to route the oil cooler hoses 1 and 2 through the guide wire.
- F** Install the front brake hose 2, making sure to face the white paint mark forward.
- G** Route the oil cooler hose 1 and 2 between the exhaust pipe and the engine bracket.
- H** Route the battery negative lead behind the clutch cable holder.
- I** Route the air vent hose through the bracket.
- J** Make sure that the white paint mark on the air filter case breather hose
- K** Make sure that the clip end is facing the left side of the vehicle.
- L** Route the throttle cable under the cross pipe and left of the steering column as shown in the illustration.



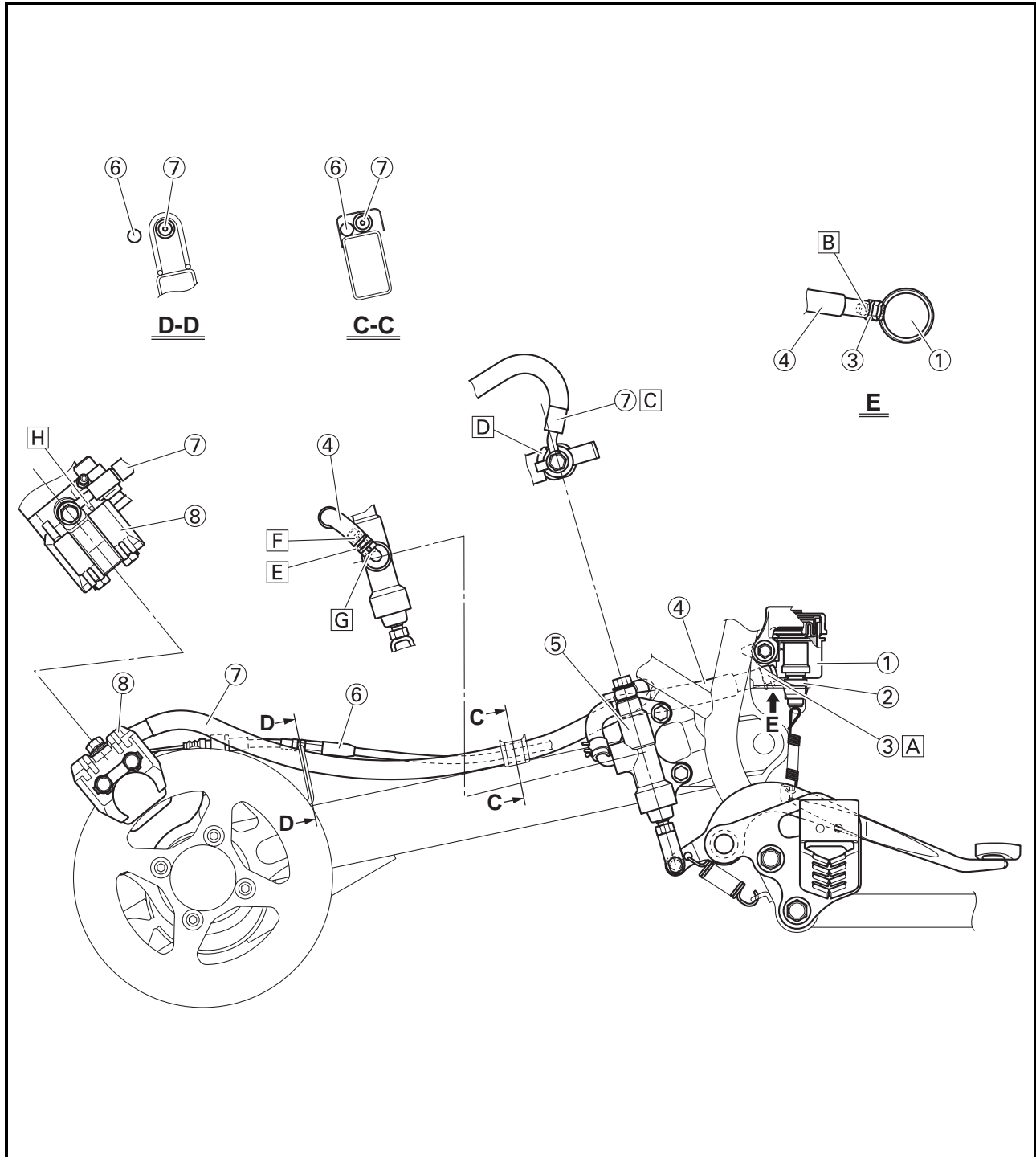


- M** Route the parking brake cable and the clutch cable under the cross pipe and right of the steering column as shown in the illustration.
- N** Route the rear brake light switch lead, neutral switch lead, air vent hose, carburetor overflow hose and parking brake cable through the bracket.
- O** Route the rear brake light switch lead under the bracket.
- P** Route the rear brake light switch lead between the bracket and rear brake reservoir tank.
- Q** Route the neutral switch lead and rear brake light switch lead as shown in the illustration.



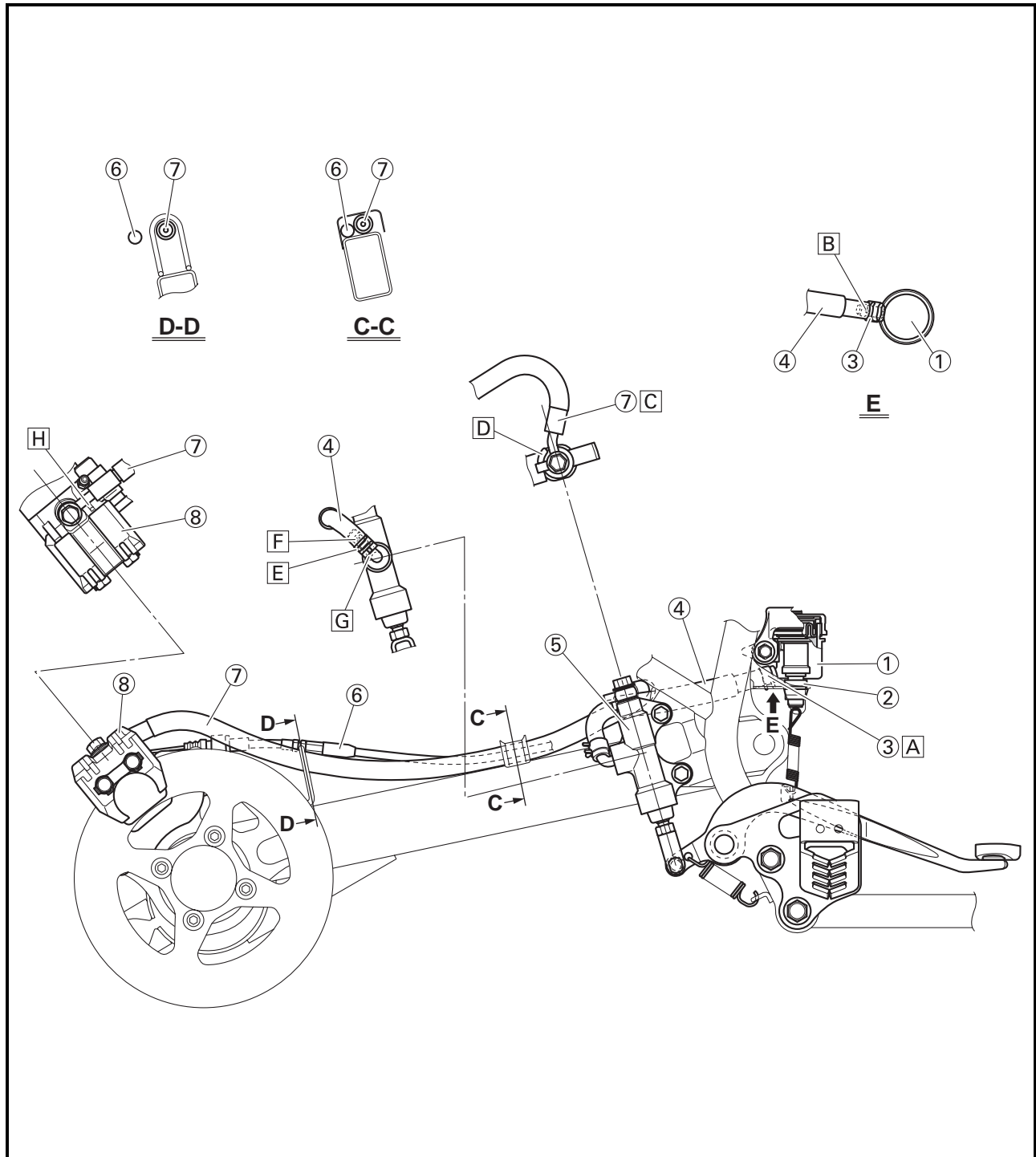


- ① Rear brake reservoir
- ② Rear brake light switch
- ③ Clip
- ④ Rear brake reservoir hose
- ⑤ Rear brake master cylinder
- ⑥ Parking brake cable
- ⑦ Rear brake hose
- ⑧ Rear brake caliper



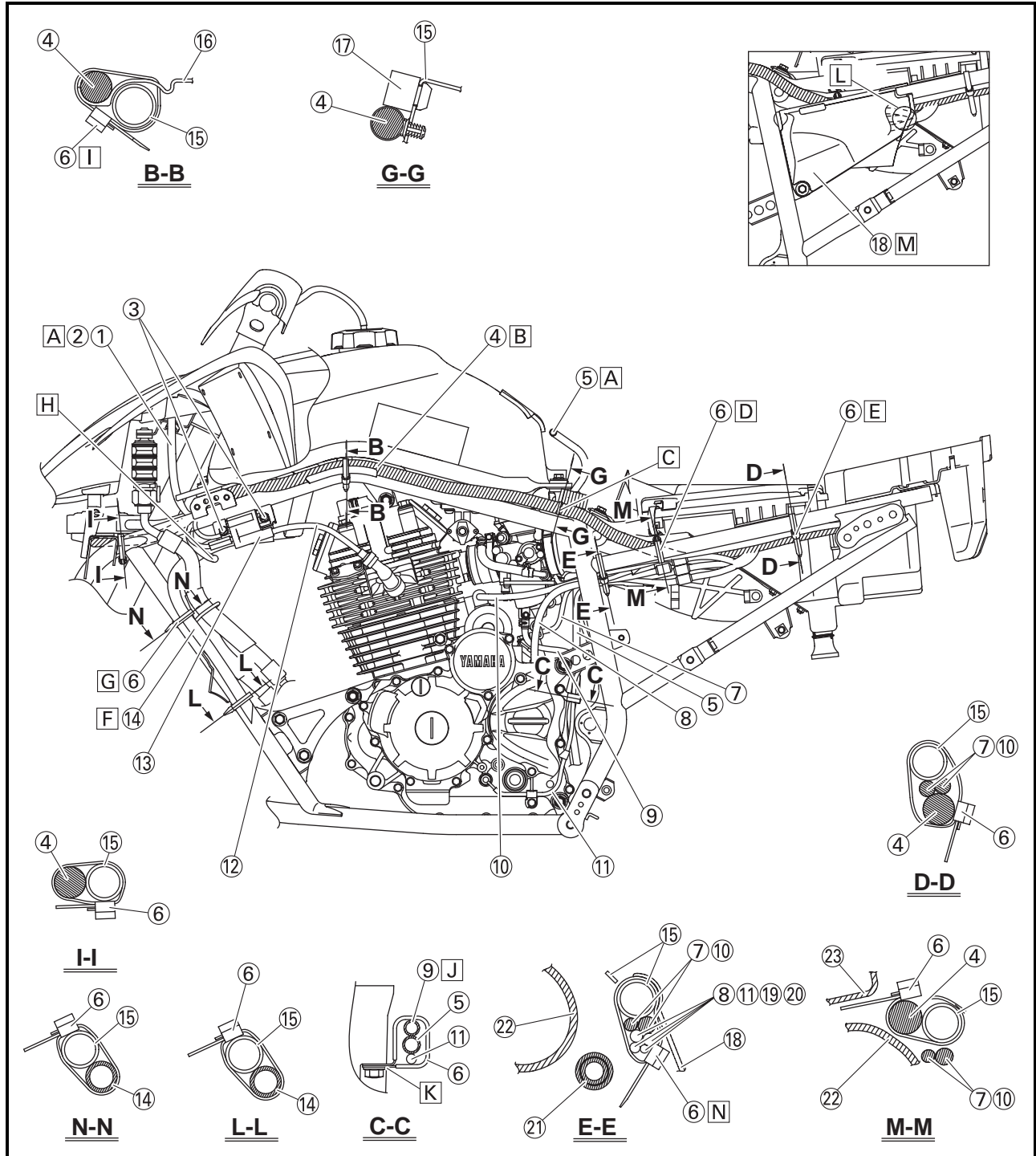


- A** Make sure that the end of the clip is facing downward.
- B** Set the rear brake reservoir hose with the positioning yellow paint mark pointing down.
- C** Install the rear brake hose in the direction shown in the illustration.
- D** Insert the rear brake hose until it contacts the projection.
- E** Make sure that the end of the clip is facing outward.
- F** Install the rear brake reservoir hose, making sure to face the white paint mark outward.
- G** Insert the rear brake reservoir hose until it contacts the projection.
- H** When installing the rear brake hose, make sure that the metal part on the rear brake Inlet hose is touching the stopper of the rear caliper.



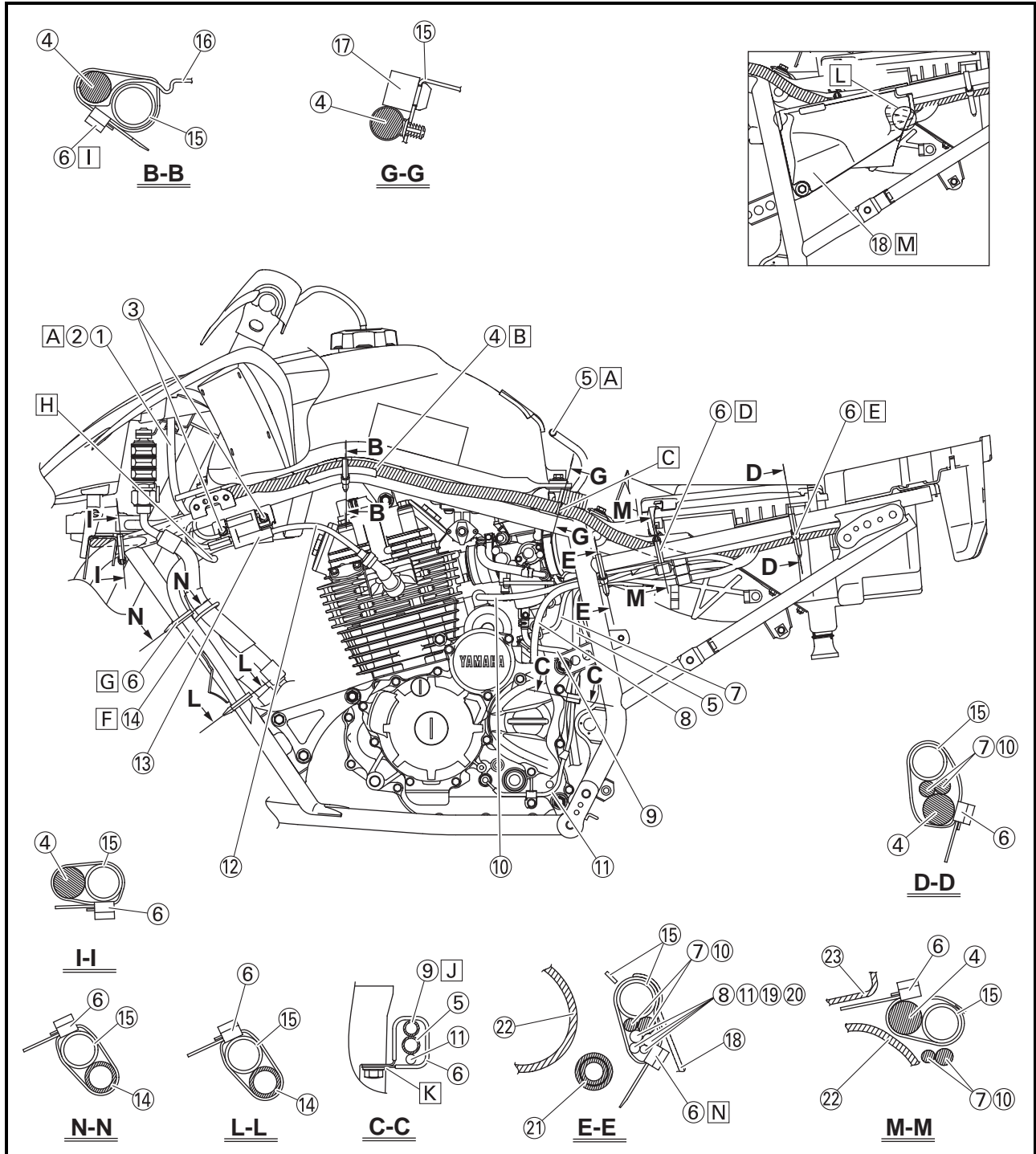


- | | | |
|----------------------------|---------------------------------|---------------------------------|
| ① Clutch switch lead | ⑪ Neutral switch lead | ⑳ Air filter case breather hose |
| ② Handlebar switch lead | ⑫ Ignition coil spark plug lead | ㉑ Air filter joint |
| ③ Bolt | ⑬ Ignition coil | ㉒ Air filter case |
| ④ Main harness | ⑭ Drain hose | |
| ⑤ Air vent hose | ⑮ Frame complete | |
| ⑥ Clamp | ⑯ Damper plate | |
| ⑦ Battery negative lead | ⑰ Seat pad | |
| ⑧ AC magneto lead | ⑱ Cover | |
| ⑨ Carburetor overflow hose | ⑲ Rear brake light switch lead | |
| ⑩ Starter motor lead | ⑳ Carburetor warmer lead | |



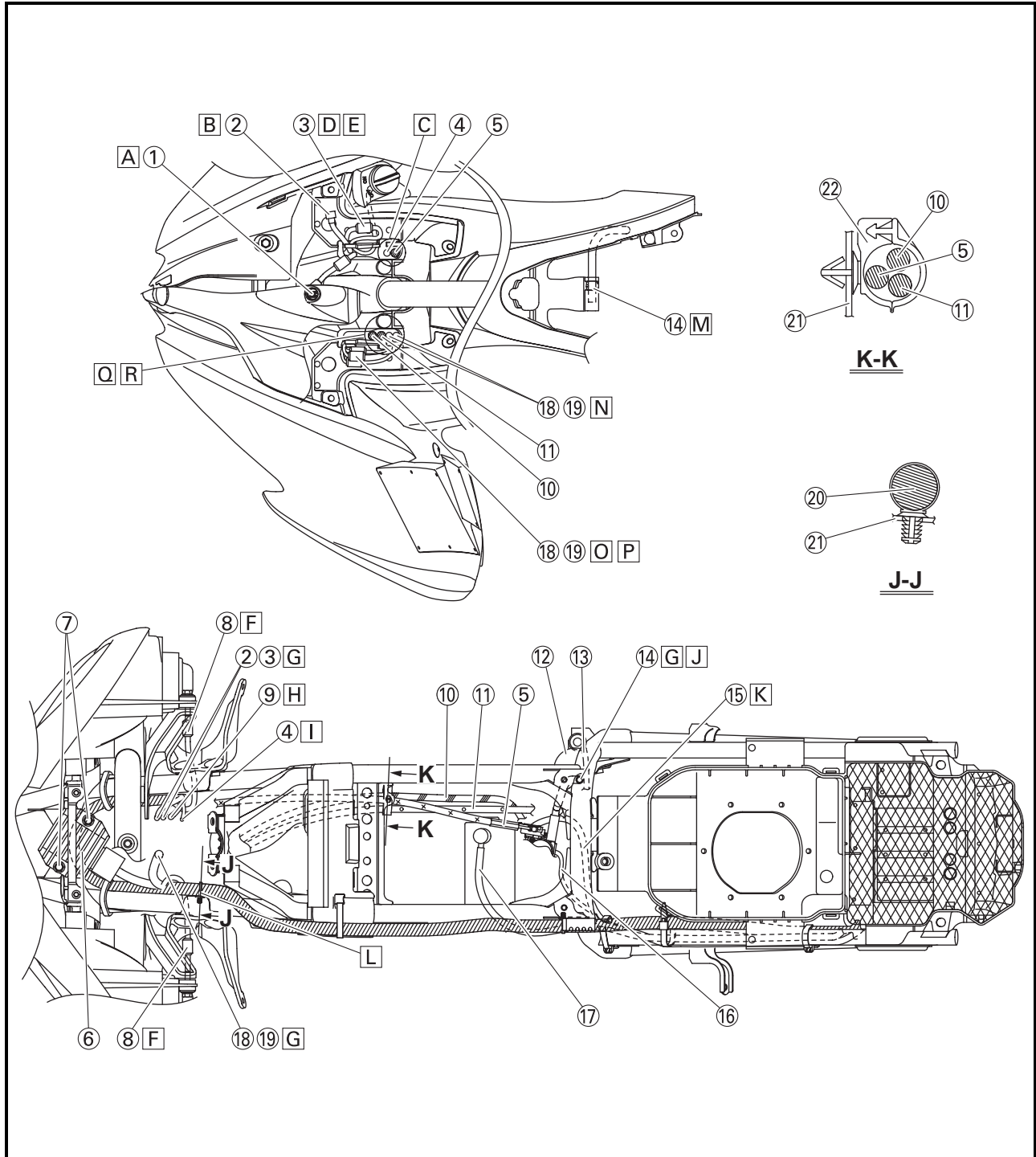


- A** To the front fender
- B** Route the wire harness above the guide for the damper plate.
- C** Fix point for wire harness
- D** Clamp near the hook of the air filter.
- E** Clamp near the edge of the air filter case.
- F** Route the drain hose in front of the left oil cooler hose.
- G** Clamp on top of the frame bracket.
- H** To the left headlight
- I** Route the clamp through the damper plate hole.
- J** Route the carburetor overflow hose as shown in the illustration.
- K** Fasten the clamp with the engine.
- L** Route the leads on the upper inside of the cover.
- M** Place the couplers on the inside of the cover.
- N** Route the clamp through the frame bracket.



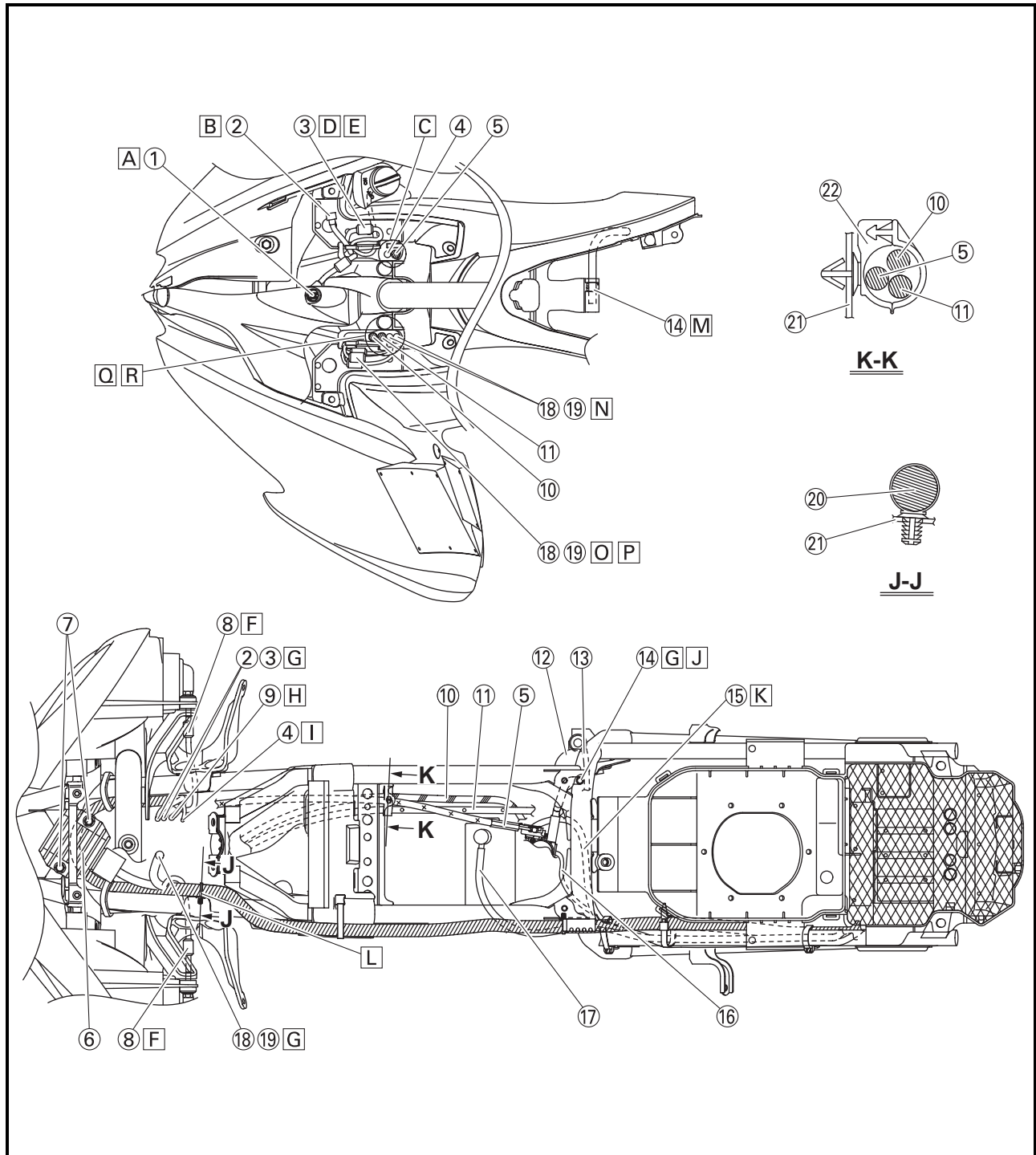


- ① Indicator light
- ② Coupler joint
- ③ Main switch lead
- ④ Front brake light switch lead
- ⑤ Throttle cable
- ⑥ Regulator
- ⑦ Flange bolt
- ⑧ Headlight lead
- ⑨ Indicator light lead
- ⑩ Clutch cable
- ⑪ Parking brake cable
- ⑫ Rear brake reservoir
- ⑬ Rear brake light switch lead
- ⑭ Air vent hose
- ⑮ Battery negative lead
- ⑯ Carburetor warmer lead
- ⑰ Starter motor lead
- ⑱ Clutch switch lead
- ⑲ Handlebar switch lead
- ⑳ Main harness
- ㉑ Frame complete
- ㉒ Clamp



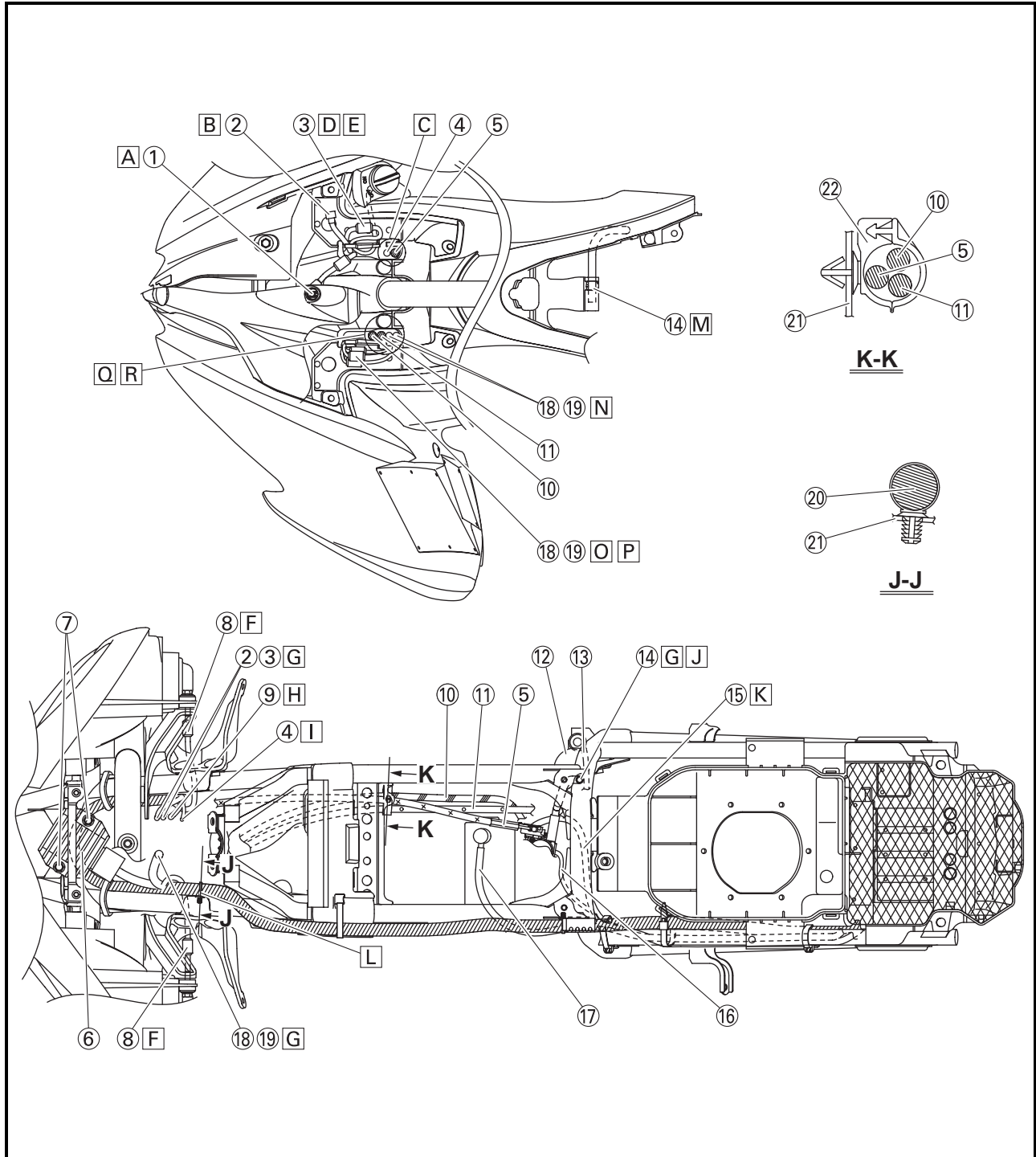


- A** Install the indicator light as shown in the illustration.
- B** Place the coupler joint above the front fender.
- C** Route the front brake light switch lead and throttle cable through the guide.
- D** Connect the main switch lead on top of the front fender.
- E** Route both leads from the front.
- F** Route the headlight lead under the frame.
- G** To the front fender
- H** To the front panel
- I** To the handlebar
- J** Route the air vent hose through the bracket.
- K** Route the battery negative lead behind the clutch cable holder.
- L** Fix point for wire harness
- M** Insert the air vent hose into the fender.
- N** Route the clutch switch lead and handlebar switch lead on the box shaped part.
- O** Connect the clutch switch lead and handlebar switch lead on top of the front fender.
- P** Route the wire harness from the front.



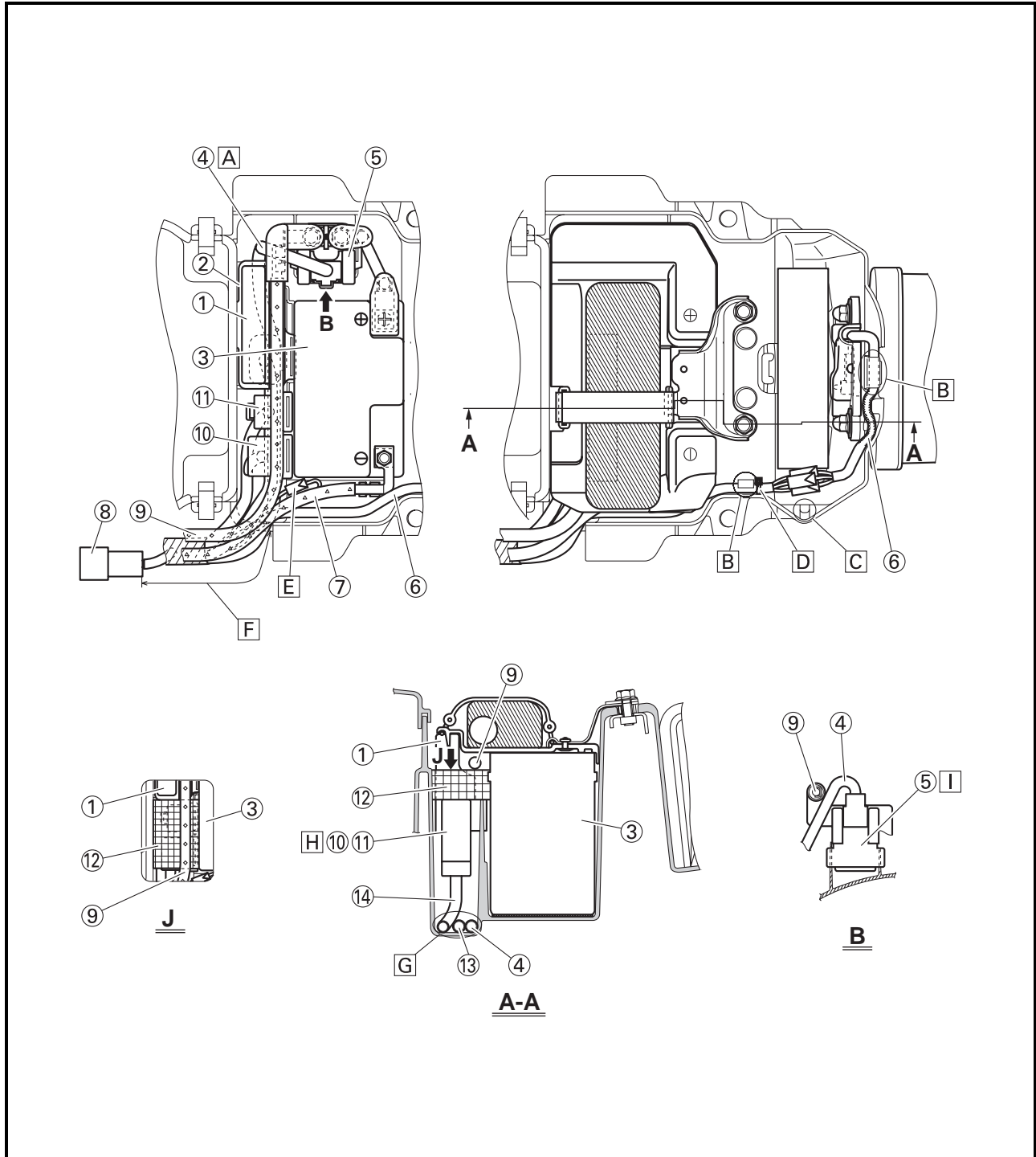


- Q Route the cables and leads through the guide of the front fender.
- R Route the leads behind the clutch and parking brake cable.



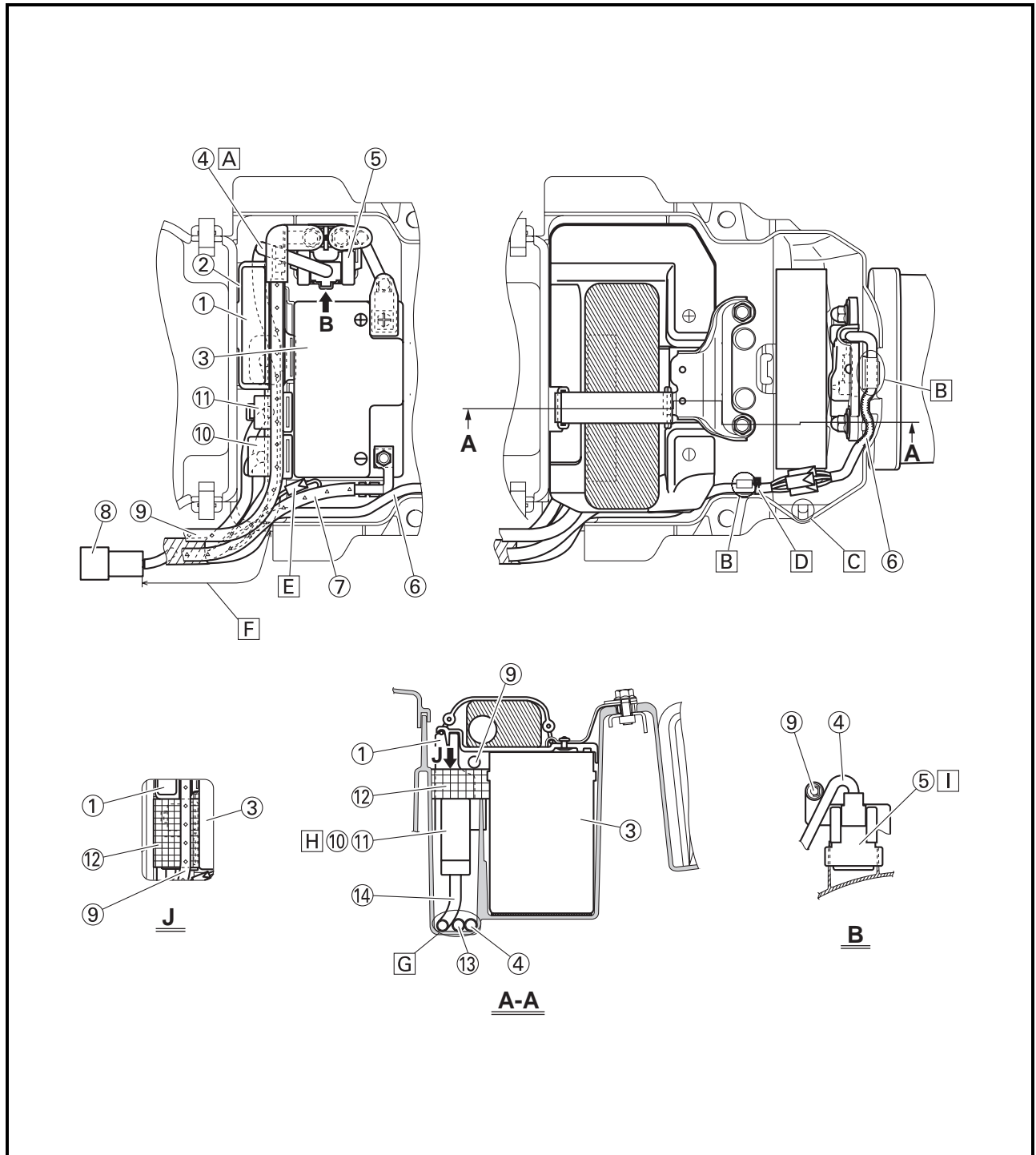


- ① CDI unit
- ② Band
- ③ Battery
- ④ Starter relay lead
- ⑤ Starter relay
- ⑥ Taillight lead
- ⑦ Battery negative lead
- ⑧ AC magneto coupler
- ⑨ Starter motor lead
- ⑩ Headlight relay
- ⑪ Neutral relay
- ⑫ Damper
- ⑬ CDI unit lead
- ⑭ Relay lead





- A** Route the starter relay lead under the starter motor lead.
- B** Clamp the taillight lead.
- C** Do not clamp.
- D** When clamping the wire harness, make sure that the insulator lock is behind the clamp.
- E** After connecting the battery negative lead, push the sag in the box.
- F** After connecting the taillight lead and each electric part, the length between the air filter and AC magneto coupler should be 185 mm (7.28 in) on straight line.
- G** There is no particular order in placing each lead.
- H** Insert each relay all the way into the rib on the air filter side.
- I** Insert the starter relay all the way into the rib on the air filter side.



EBS00029

PERIODIC CHECKS AND ADJUSTMENTS

INTRODUCTION

This chapter includes all information necessary to perform recommended checks and adjustments. These preventive maintenance procedures, if followed, will ensure more reliable machine operation and a longer service life. The need for costly overhaul work will be greatly reduced. This information applies to machines already in service as well as to new machines that are being prepared for sale. All service technicians should be familiar with this entire chapter.

PERIODIC MAINTENANCE CHART FOR THE EMISSION CONTROL SYSTEM

NOTE: _____

- For ATVs not equipped with an odometer or an hour meter, follow the month maintenance intervals.
- For ATVs equipped with an odometer or an hour meter, follow the km (mi) or hours maintenance intervals. However, keep in mind that if the ATV isn't used for a long period of time, the month maintenance intervals should be followed.
- Items marked with an asterisk should be performed by a Yamaha dealer as they require special tools, data and technical skills.

NO.	ITEM	CHECK OR MAINTENANCE JOB	Whichever comes first ⇒	INITIAL			EVERY		
				month	1	3	6	6	12
				km (mi)	320 (200)	1300 (800)	2500 (1600)	2500 (1600)	5000 (3200)
				hours	20	80	160	160	320
1	* Fuel line	• Check fuel hoses for cracks or other damage, and replace if necessary.			√	√	√		
2	Spark plug	• Check condition and clean, regap, or replace if necessary.	√	√	√	√	√		
3	* Valves	• Check valve clearance and adjust if necessary.	√		√	√	√		
4	* Carburetor	• Check starter (choke) operation and correct if necessary. • Check engine idling speed and adjust if necessary.		√	√	√	√		
5	* Crankcase breather system	• Check breather hose for cracks or other damage, and replace if necessary.			√	√	√		
6	* Exhaust system	• Check for leakage and replace gasket(s) if necessary. • Check for looseness and tighten all screw clamps and joints if necessary.			√	√	√		
7	Spark arrester	• Clean.			√	√	√		

GENERAL MAINTENANCE AND LUBRICATION CHART



GENERAL MAINTENANCE AND LUBRICATION CHART

NO.	ITEM	CHECK OR MAINTENANCE JOB	Whichever comes first ⇒	INITIAL			EVERY		
				month	1	3	6	6	12
				km (mi)	320 (200)	1300 (800)	2500 (1600)	2500 (1600)	5000 (3200)
hours	20	80	160	160	320				
1	Air filter element	• Clean and replace if necessary.		Every 20 ~ 40 hours (more often in wet or dusty areas)					
2	* Clutch	• Check operation and adjust if necessary.		√		√	√	√	
3	* Front brake	• Check operation and correct if necessary. • Check fluid level and ATV for fluid leakage, and correct if necessary.		√	√	√	√	√	
		• Replace brake pads.		Whenever worn to the limit					
4	* Rear brake	• Check operation and correct if necessary. • Check fluid level and ATV for fluid leakage, and correct if necessary.		√	√	√	√	√	
		• Replace brake pads.		Whenever worn to the limit					
5	* Brake hoses	• Check for cracks or other damage, and replace if necessary.			√	√	√	√	
		• Replace.		Every 4 years					
6	* Parking brake	• Check operation and adjust if necessary.		√	√	√	√	√	
7	* Wheels	• Check runout and for damage, and replace if necessary.		√		√	√	√	
8	* Tires	• Check tread depth and for damage, and replace if necessary. • Check air pressure and balance, and correct if necessary.		√		√	√	√	
9	* Wheel hub bearings	• Check for looseness or damage, and replace if necessary.		√		√	√	√	
10	* Swingarm pivots	• Check operation and for excessive play, and replace bearings if necessary. • Lubricate with lithium-soap-based grease.				√	√	√	
11	* Upper and lower arm pivots	• Lubricate with lithium-soap-based grease.				√	√	√	
12	Drive chain	• Check chain slack and adjust if necessary. • Check rear wheel alignment and correct if necessary. • Clean and lubricate.		√	√	√	√	√	
13	* Drive chain rollers	• Check for wear and replace if necessary.				√	√	√	
14	* Chassis fasteners	• Make sure that all nuts, bolts, and screws are properly tightened.		√	√	√	√	√	
15	* Shock absorber assemblies	• Check operation and correct if necessary. • Check for oil leakage and replace if necessary.				√	√	√	
16	* Rear suspension relay arm and connecting arm pivoting points	• Check operation and correct if necessary. • Lubricate with lithium-soap-based grease.			√	√	√	√	
17	* Steering shaft	• Lubricate with lithium-soap-based grease.				√	√	√	
18	* Steering system	• Check operation and repair or replace if damaged. • Check toe-in and adjust if necessary.		√	√	√	√	√	
19	* Engine mount	• Check for cracks or other damage, and replace if necessary.				√	√	√	
20	Engine oil	• Change. • Check ATV for oil leakage, and correct if necessary.		√		√	√	√	
21	Engine oil filter element	• Clean or replace if necessary.		√		√		√	
22	* Moving parts and cables	• Lubricate.			√	√	√	√	
23	* Throttle lever housing and cable	• Check operation and correct if necessary. • Check throttle cable free play and adjust if necessary. • Lubricate throttle lever housing and cable.		√	√	√	√	√	
24	* Front and rear brake switches	• Check operation and correct if necessary.		√	√	√	√	√	
25	* Lights and switches	• Check operation and correct if necessary. • Adjust headlight beams.		√	√	√	√	√	

3



NOTE:

- The air filter needs more frequent service if you are riding in unusually wet or dusty areas.
 - Hydraulic brake service
 - Regularly check and, if necessary, correct the brake fluid level.
 - Every two years replace the internal components of the brake master cylinders and calipers, and change the brake fluid.
 - Replace the brake hoses every four years and if cracked or damaged.
-

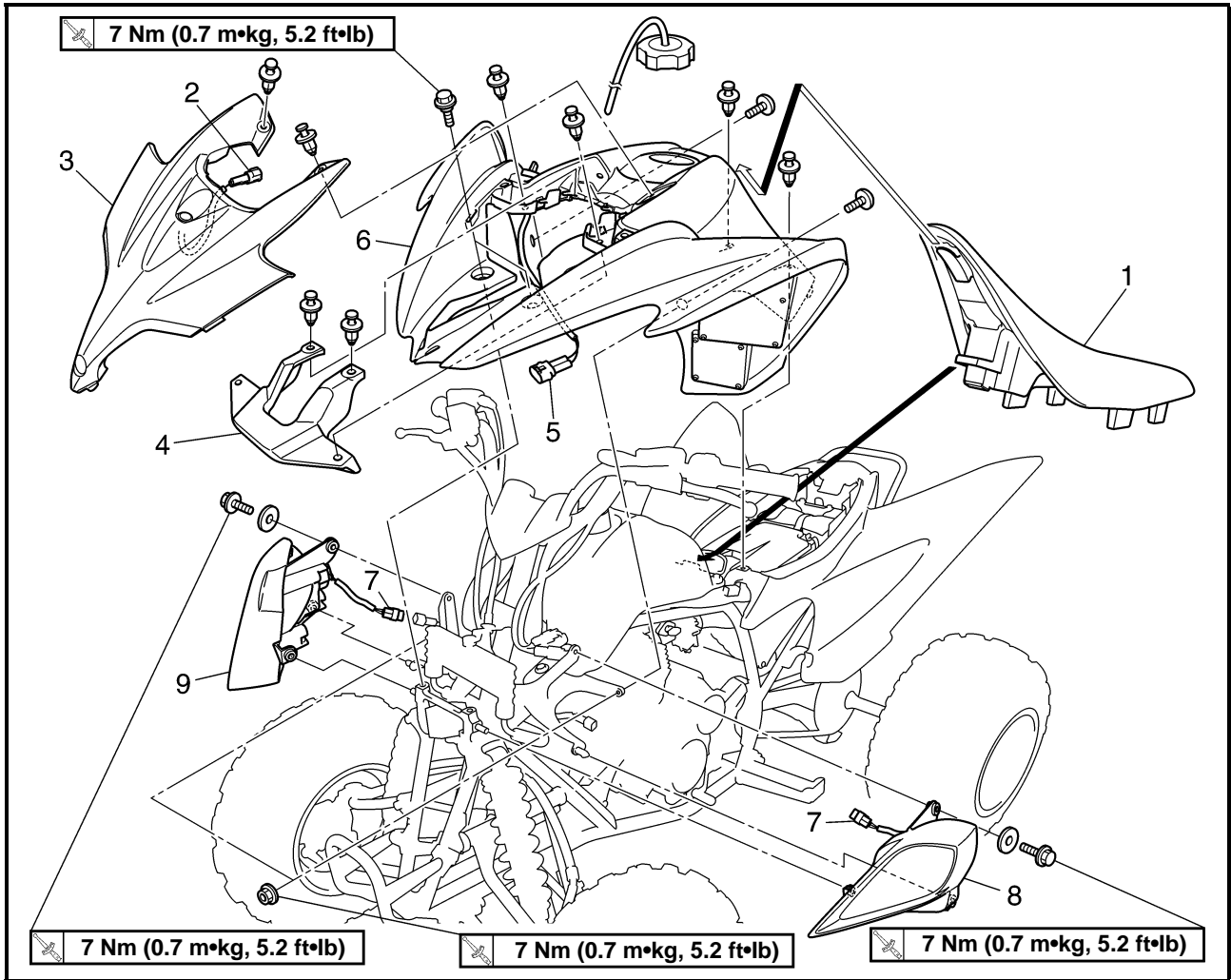
 WARNING

Indicates a potential hazard that could result in serious injury or death.

EBS00033

SEAT, FENDERS AND FUEL TANK

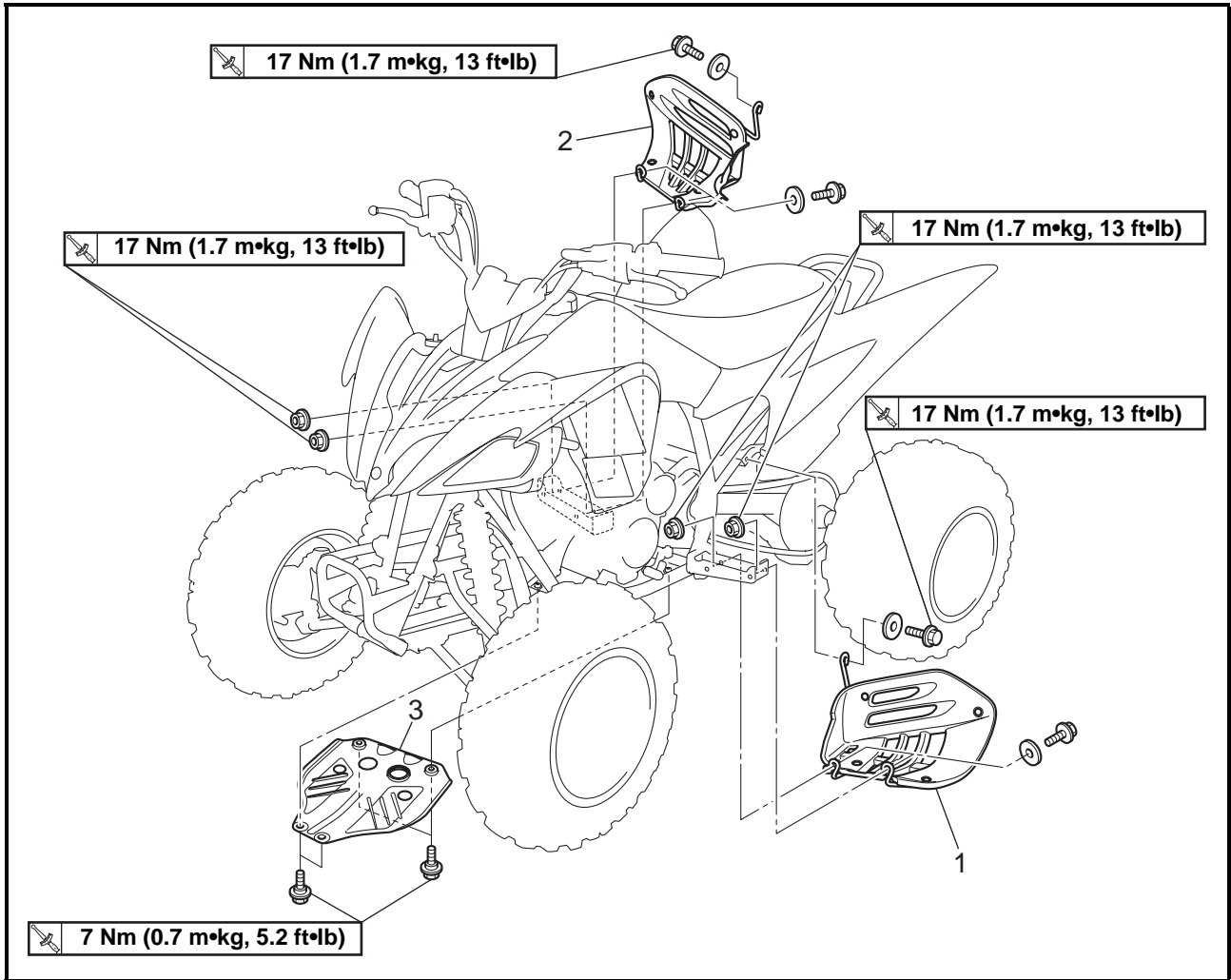
SEAT, FRONT FENDER AND HEADLIGHTS



Order	Job/Part	Q'ty	Remarks
	Removing the seat, front fender and headlights		Remove the parts in the order listed.
1	Seat	1	NOTE: _____ Pull back the seat lock lever, than pull up on the rear of the seat.
2	Indicator light coupler	1	Disconnect.
3	Front panel	1	
4	Plate	1	
5	Main switch coupler	1	Disconnect.
6	Front fender	1	
7	Headlight coupler	2	Disconnect.
8	Left headlight	1	
9	Right headlight	1	
			For installation, reverse the removal procedure.

EBS00034

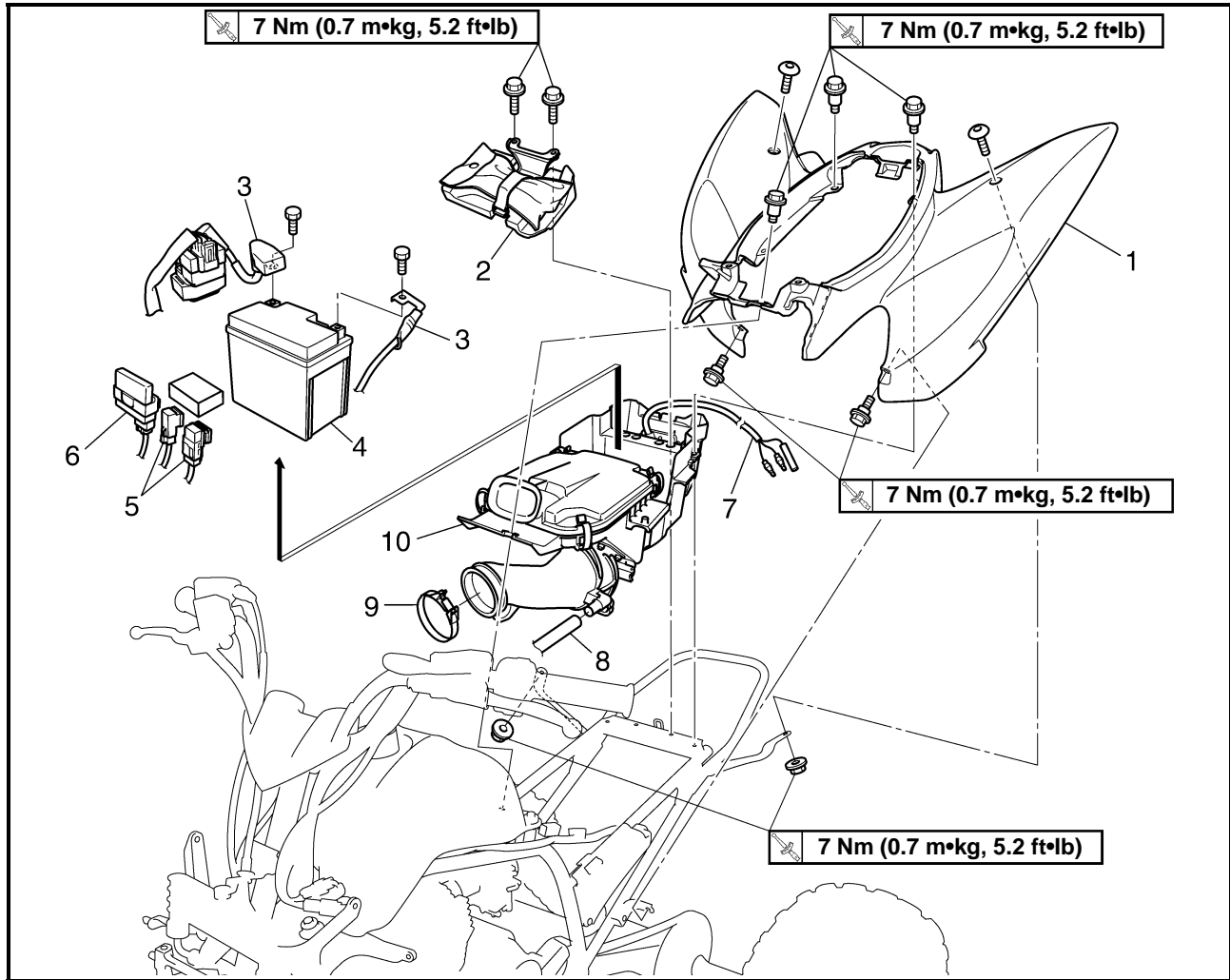
FOOT PROTECTORS AND ENGINE SKID PLATE



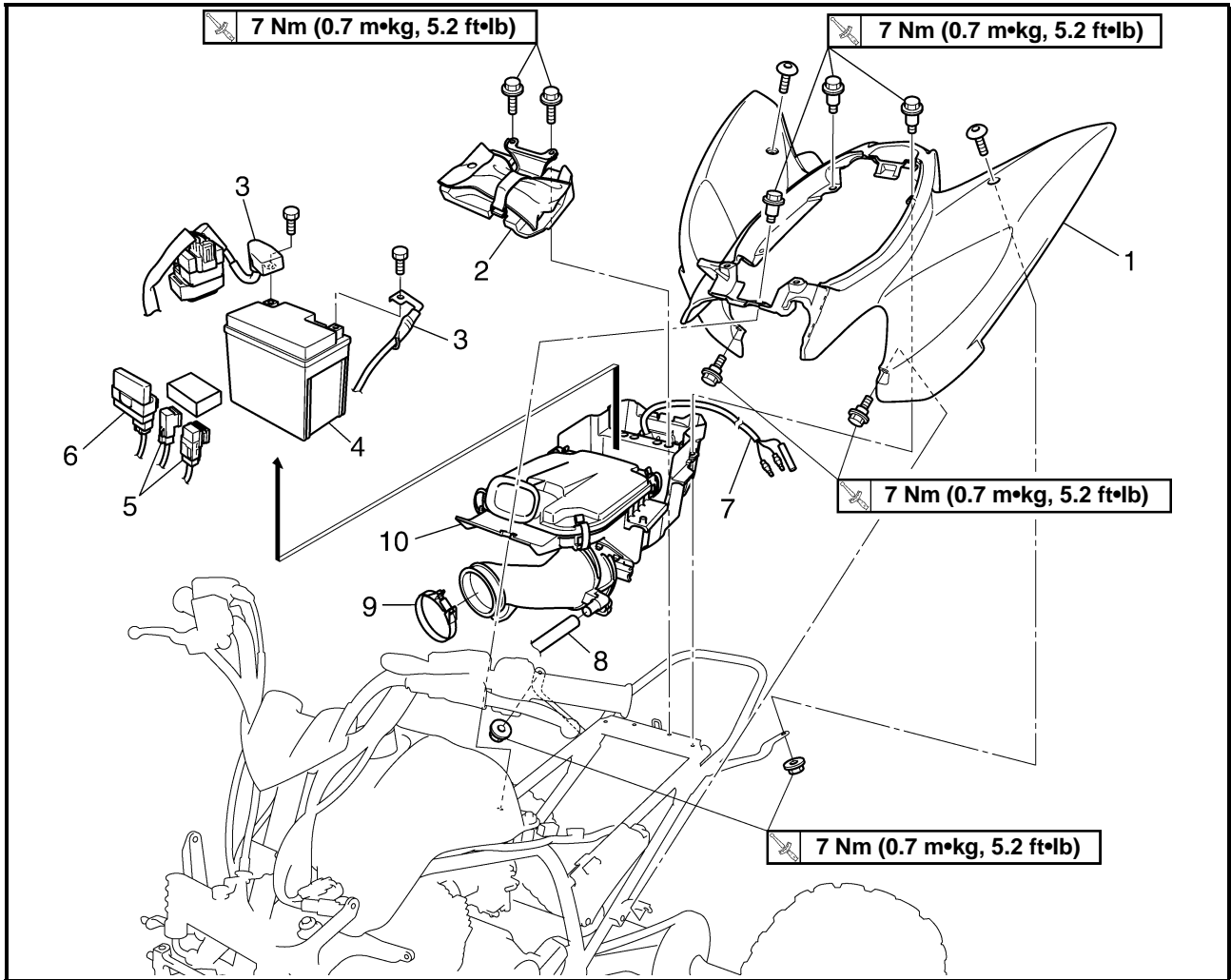
Order	Job/Part	Q'ty	Remarks
	Removing the foot protectors and engine skid plate		Remove the parts in the order listed.
1	Left foot protector	1	
2	Right foot protector	1	
3	Engine skid plate	1	
			For installation, reverse the removal procedure.



REAR FENDER AND AIR FILTER CASE



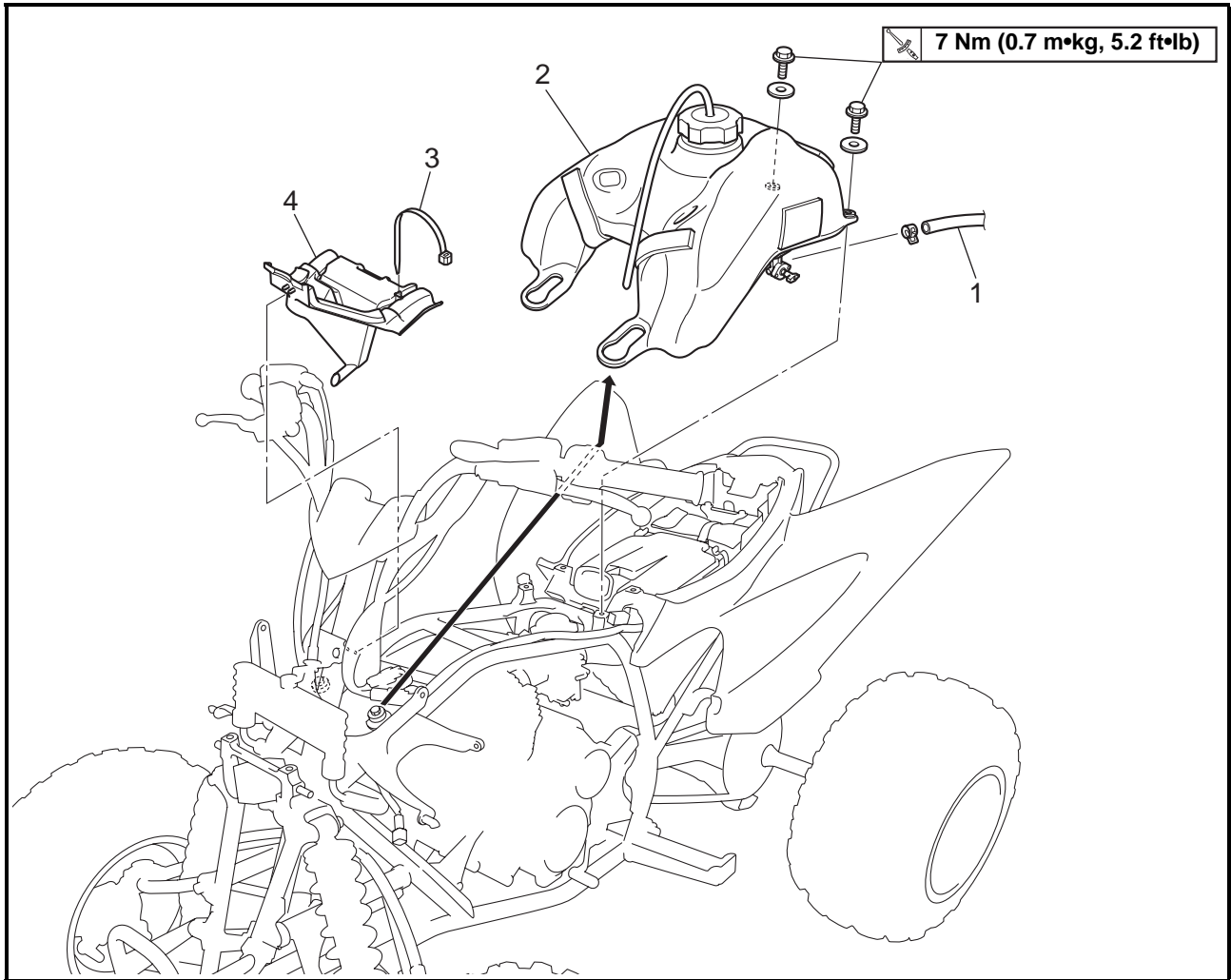
Order	Job/Part	Q'ty	Remarks
	Removing the rear fender and air filter case		Remove the parts in the order listed.
	Seat/front fender		Refer to "SEAT, FENDERS AND FUEL TANK".
1	Rear fender	1	<div style="background-color: #cccccc; padding: 5px;">CAUTION:</div> _____ First disconnect the negative lead, then disconnect the positive lead. _____
2	Battery cover	1	
3	Battery lead	2	
4	Battery	1	
5	Relay	2	
6	CDI unit	1	
7	Tail/brake light lead	1	Disconnect.
8	Air filter case breather hose	1	Disconnect.
9	Clamp	1	Loosen.



Order	Job/Part	Q'ty	Remarks
10	Air filter case	1	For installation, reverse the removal procedure.

EBS00042

FUEL TANK



Order	Job/Part	Q'ty	Remarks
	Removing the fuel tank		
	Seat/front fender		Remove the parts in the order listed. Refer to "SEAT, FENDERS AND FUEL TANK".
1	Fuel hose (fuel cock side)	1	NOTE: _____ Before disconnecting the fuel hose, turn the fuel cock to "OFF".
2	Fuel tank	1	NOTE: _____ When installing the fuel tank, pass the fuel tank breather hose through the hole in the handlebar protector.
3	Clamp	1	
4	Fuel tank shield	1	
			For installation, reverse the removal procedure.



EAS00048

ENGINE

ADJUSTING THE VALVE CLEARANCE

The following procedure applies to all of the valves.

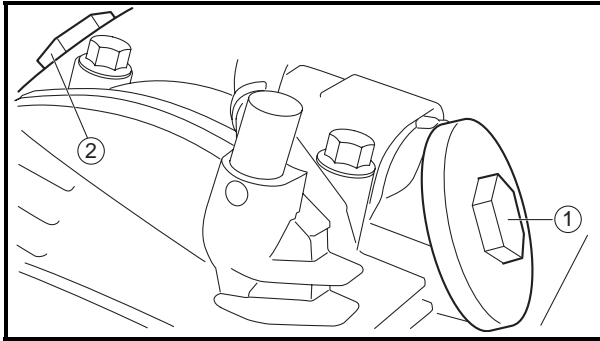
NOTE: _____

- Valve clearance adjustment should be made on a cold engine, at room temperature.
- When the valve clearance is to be measured or adjusted, the piston must be at the Top Dead Center (TDC) on the compression stroke.

1. Remove:

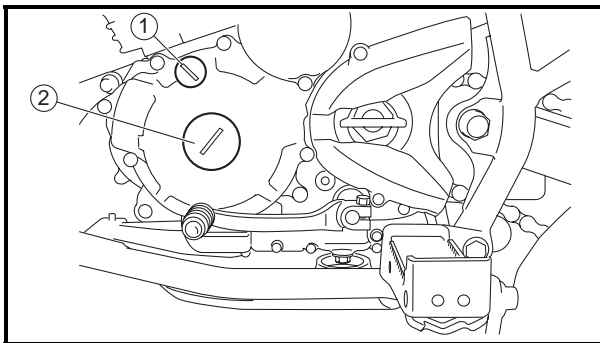
- seat
- front fender
- fuel tank

Refer to “SEAT, FENDERS AND FUEL TANK”.



2. Remove:

- spark plug cap
- spark plug
- cylinder head side cover 1 ①
- cylinder head side cover 2 ②



3. Remove:

- timing mark accessing screw ①
- crankshaft end accessing screw ②

4. Measure:

- valve clearance
- Out of specification → Adjust.



Valve clearance (cold)

Intake valve

0.05 ~ 0.10 mm
(0.0020 ~ 0.0039 in)

Exhaust valve

0.10 ~ 0.15 mm
(0.0039 ~ 0.0059 in)



- d. Measure the valve clearance again.
- e. If the valve clearance is still out of specification, repeat all of the valve clearance adjustment steps until the specified clearance is obtained.



- 6. Install:
 - all removed parts

NOTE: _____

For installation, reverse the removal procedure.

EBS00051

ADJUSTING THE ENGINE IDLING SPEED

- 1. Start the engine and let it warm up for several minutes.
- 2. Attach:
 - digital tachometer
(onto the ignition coil spark plug lead)



Digital tachometer
90890-06760, YU-39951-B

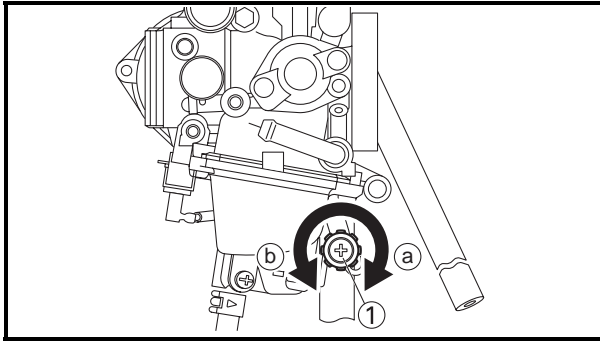
- 3. Measure:
 - engine idling speed
Out of specification → Adjust.



Engine idling speed
1,500 ~ 1,600 r/min

ADJUSTING THE ENGINE IDLING SPEED/ ADJUSTING THE THROTTLE LEVER FREE PLAY

CHK
ADJ



4. Adjust:
- engine idling speed



- a. Turn the throttle stop screw ① in direction ② or ③ until the specified idling speed is obtained.

Direction ②	Idling speed becomes higher.
Direction ③	Idling speed becomes lower.



5. Remove:
- fuel tank

NOTE: _____

Slide the fuel tank.

6. Detach:
- digital tachometer
7. Adjust:
- throttle lever free play
- Refer to “ADJUSTING THE THROTTLE LEVER FREE PLAY”.

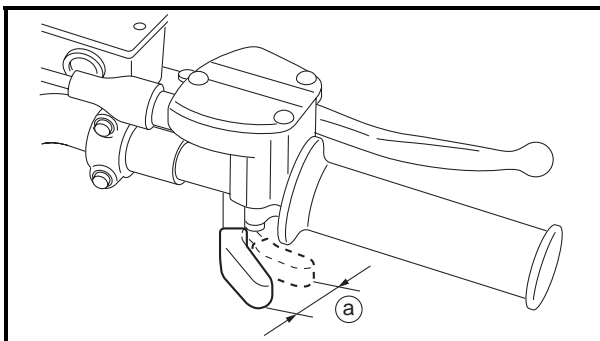
	Throttle lever free play 2 ~ 4 mm (0.08 ~ 0.16 in)
--	--

EBS00052

ADJUSTING THE THROTTLE LEVER FREE PLAY

NOTE: _____

Engine idling speed should be adjusted properly before adjusting the throttle lever free play.

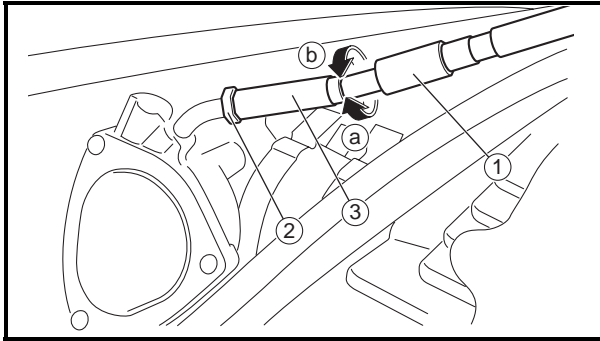


1. Measure:
- throttle lever free play ④
- Out of specification → Adjust.

	Throttle lever free play 2 ~ 4 mm (0.08 ~ 0.16 in)
--	--

ADJUSTING THE THROTTLE LEVER FREE PLAY/ ADJUSTING THE SPEED LIMITER

CHK
ADJ



2. Adjust:
- throttle lever free play



First step:

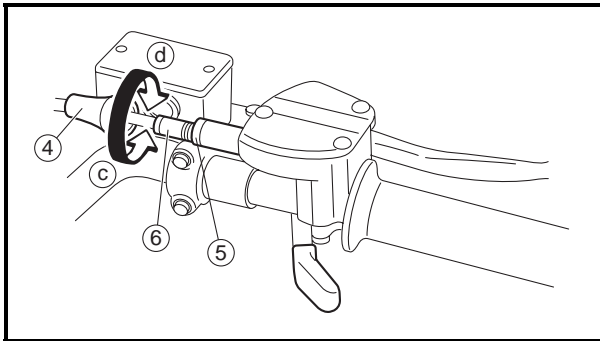
- Slide back the rubber cover (1).
- Loosen the locknut (2) on the carburetor side.
- Turn the adjusting nut (3) in direction (a) or (b) until the correct free play is obtained.

Direction (a)	Free play is increased.
Direction (b)	Free play is decreased.

- Tighten the locknut.
- Slide the rubber cover to its original position.

NOTE: _____

If the free play cannot be adjusted here, adjust it at the throttle lever side of the cable.



Second step:

- Slide back the rubber cover (4).
- Loosen the locknut (5).
- Turn the adjusting bolt (6) in direction (c) or (d) until the correct free play is obtained.

Direction (c)	Free play is increased.
Direction (d)	Free play is decreased.

- Tighten the locknut.
- Slide the rubber cover to its original position.

⚠ WARNING _____

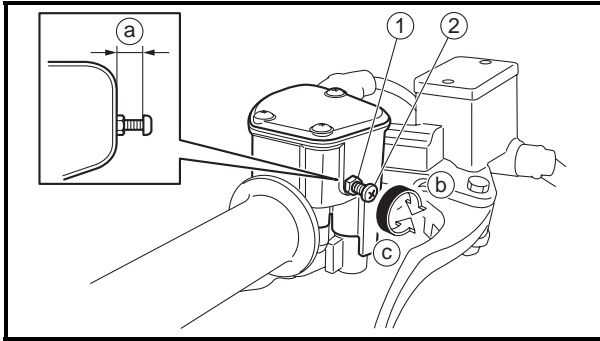
After adjusting the free play, turn the handlebar to the right and left to make sure that the engine idling speed does not increase.



EBS00053

ADJUSTING THE SPEED LIMITER

The speed limiter keeps the carburetor throttle from becoming fully-opened even when the throttle lever is applied to the maximum position. Screwing in the adjusting screw stops the engine speed from increasing.



1. Measure:
 - Speed limiter length ①
 - Out of specification → Adjust.

	Speed limiter length Less than 12 mm (0.47 in)
---	--

2. Adjust:
 - speed limiter length



- a. Loosen the locknut ①.
- b. Turn the adjusting screw ② in or out until the specified speed limiter length is obtained.

Direction ②	Speed limiter length is decreased.
Direction ③	Speed limiter length is increased.

- c. Tighten the locknut.

⚠ WARNING

- Particularly for a beginner rider, the speed limiter should be screwed in completely. Screw it out little by little as their riding technique improves. Never remove the speed limiter for a beginning rider.
- For proper throttle lever operation do not turn out the adjusting screw more than 12 mm (0.47 in). Also, always adjust the throttle lever free play to 2 ~ 4 mm (0.08 ~ 0.16 in).



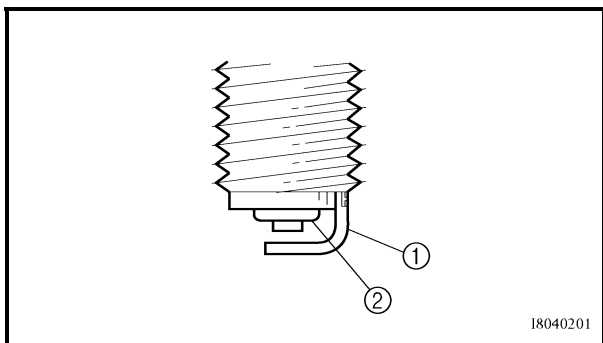


EBS00057

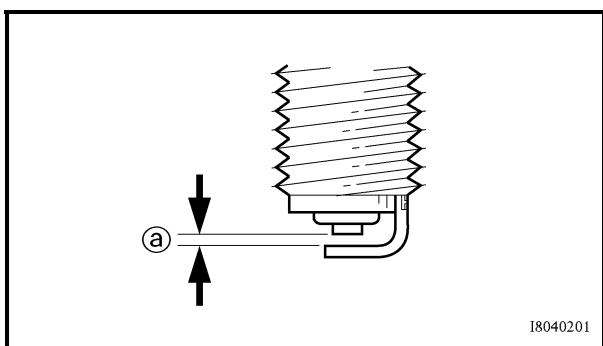
CHECKING THE SPARK PLUG

1. Disconnect:
 - spark plug cap
2. Remove:
 - spark plug
3. Check:
 - spark plug type
Incorrect → Change.

**Standard spark plug
NGK/DR7EA**



4. Check:
 - electrode ①
Wear/damage → Replace.
 - insulator ②
Abnormal color → Replace.
Normal color is a medium-to-light tan color.
5. Clean:
 - spark plug
(with a spark plug cleaner or wire brush)



6. Measure:
 - spark plug gap ①
Use a wire gauge or thickness gauge.
Out of specification → Regap.



Spark plug gap
0.6 ~ 0.7 mm (0.024 ~ 0.028 in)

7. Install:
 - spark plug



Spark plug
18 Nm (1.8 m•kg, 13 ft•lb)

NOTE: _____
Before installing a spark plug, clean the gasket surface and plug surface.

8. Install:
 - spark plug cap

EBS00058

CHECKING THE IGNITION TIMING

NOTE: _____

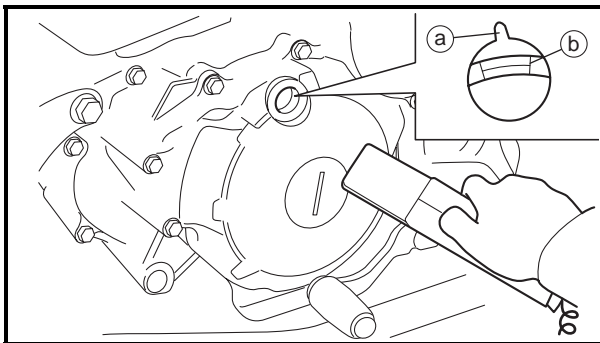
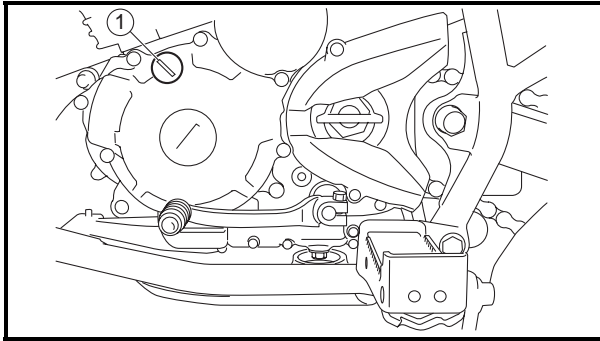
Engine idling speed and throttle cable free play should be adjusted properly before checking the ignition timing.

- Attach:
 - digital tachometer

	Digital tachometer 90890-06760, YU-39951-B
--	---

- timing light
(onto the ignition coil spark plug lead)

	Timing light 90890-03141 Inductive clamp timing light YU-03141
--	---



- Check:
 - ignition timing



- Warm up the engine and keep it at the specified speed.

	Engine speed 1,500 ~ 1,600 r/min
--	---

- Remove the timing mark accessing screw ①.
- Visually check the stationary pointer (a) to verify it is within the required firing range (b) indicated on the AC magneto rotor.
Incorrect firing range → Check the pickup coil assembly.
- Install the timing mark accessing screw.



- Detach:
 - timing light
 - digital tachometer



MEASURING THE COMPRESSION PRESSURE

The following procedure applies to the cylinder.

NOTE: _____

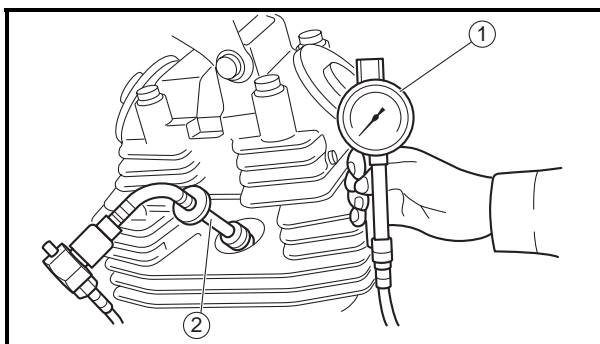
Insufficient compression pressure will result in a loss of performance.

1. Measure:
 - Valve clearance
Out of specification → Adjust.
Refer to “ADJUSTING THE VALVE CLEARANCE”
2. Start the engine, warm it up for several minutes, and then turn it off.
3. Disconnect:
 - Spark plug cap
4. Remove:
 - Spark plug

ECA13340

CAUTION: _____

Before removing the spark plug, use compressed air to blow away any dirt accumulated in the spark plug wells to prevent it from falling into the cylinder.



5. Install:
 - Compression gauge ①
 - Extension ②



Compression gauge
90890-03081
Engine compression tester
YU-33223
Extension
90890-04082



7. Install:
- Spark plug

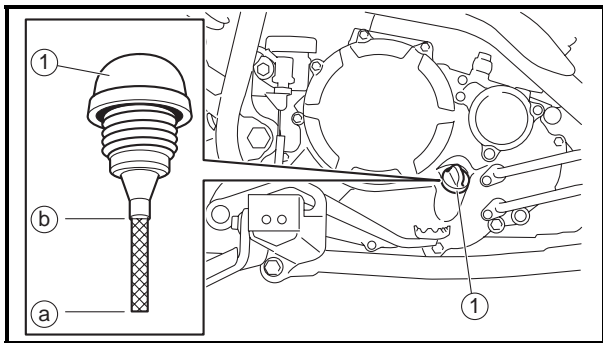
	<p>Spark plug 18 Nm (1.8 m•kg, 13 ft•lb)</p>
--	--

8. Connect:
- Spark plug cap

EBS01101

CHECKING THE ENGINE OIL LEVEL

1. Place the machine on a level surface.
2. Start the engine, warm it up several minutes, and then turn it off.



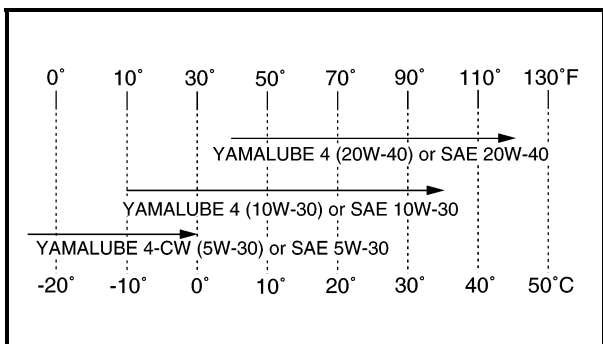
3. Check:
 - engine oil level

Oil level should be between the minimum level mark (a) and the maximum level mark (b).

Low oil level → Add oil to the proper level.

NOTE: _____

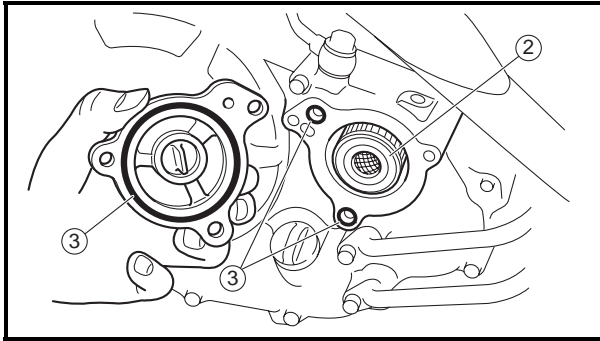
- Wait a few minutes until the oil settles before checking the oil level.
- Do not screw the dipstick (1) in when checking the oil level.




	<p>Recommended engine oil type YAMALUBE 4, SAE 5W-30 or SAE 10W-30 or SAE 20W-40</p> <p>Recommended engine oil grade API service SG type or higher JASO standard MA</p>
--	---

CAUTION: _____


- Do not add any chemical additives. Engine oil also lubricates the clutch and additives could cause clutch slippage.
- Do not allow foreign material to enter the crankcase.




8. Install:
- engine oil drain bolt gasket **New**
 - engine oil drain bolt

	Engine oil drain bolt 20 Nm (2.0 m•kg, 15 ft•lb)
---	---

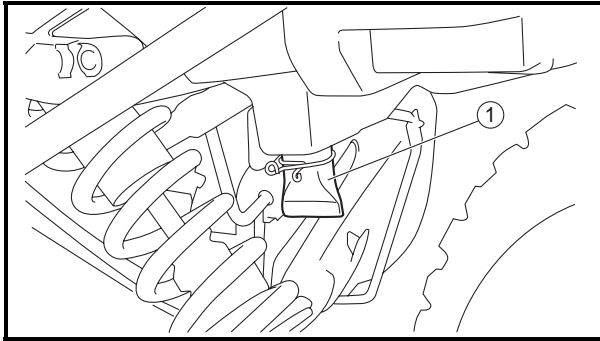
- oil filter element drain bolt

	Oil filter element drain bolt 10 Nm (1.0 m•kg, 7.4 ft•lb)
---	--

9. Fill:
- crankcase
(with the specified amount of the recommended engine oil)

	Periodic oil replacement 1.25 L (1.10 Imp qt, 1.32 US qt) With oil filter element replacement 1.35 L (1.19 Imp qt, 1.43 US qt) Engine oil quantity Total amount 1.60 L (1.41 Imp qt, 1.69 US qt)
---	---

10. Install:
- dipstick
11. Start the engine, warm it up for several minutes, and then turn it off.
12. Check:
- engine
(for engine oil leaks)
13. Check:
- engine oil level
Refer to “CHECKING THE ENGINE OIL LEVEL”.



EBS00073

CLEANING THE AIR FILTER ELEMENT

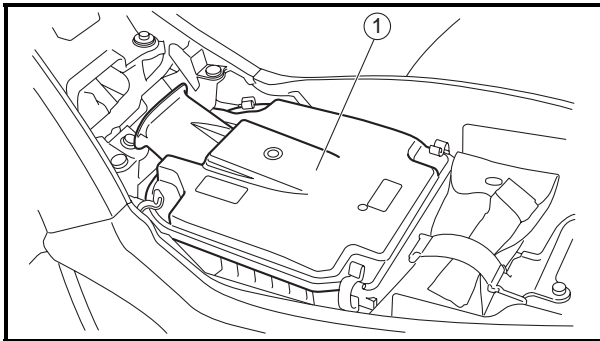
NOTE:

There is a check hose (1) at the bottom of the air filter case. If dust and/or water collects in this hose, clean the air filter element and air filter case.

1. Remove:

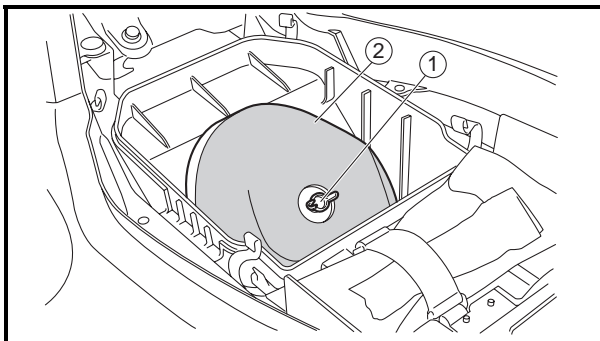
- seat

Refer to "SEAT, FENDERS AND FUEL TANK".



2. Remove:

- air filter case cover (1)



3. Remove:

- wing bolt (1)
- air filter element (2)
- air filter element frame (3)

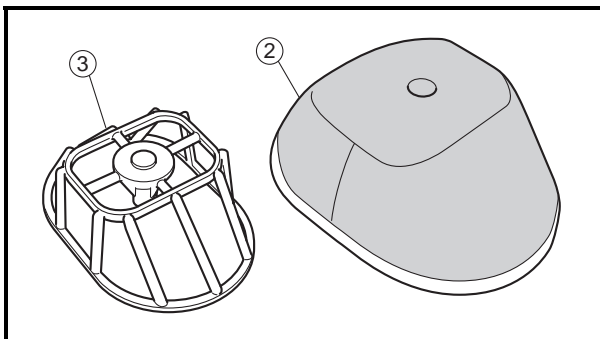
CAUTION:

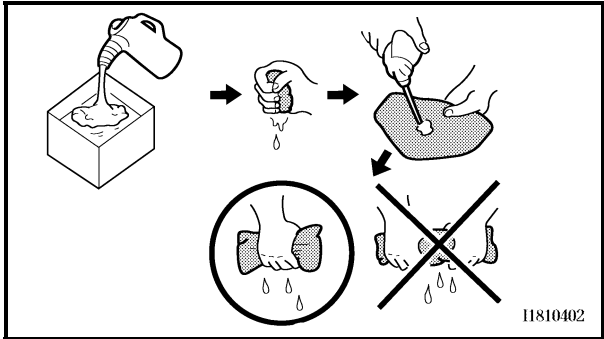
The engine should never be run without the air filter; excessive piston and/or cylinder wear may result.

4. Check:

- air filter element

Damage → Replace.





5. Clean:
- air filter element



- a. Wash the element gently, but thoroughly in solvent.

▲ WARNING _____

Use a cleaning solvent which is designed to clean parts only. Never use gasoline or low flash point solvents as they may cause a fire or explosion.

- b. Squeeze the excess solvent out of the element and let it dry.

CAUTION: _____

Do not twist or wring out the element. This could damage the foam material.

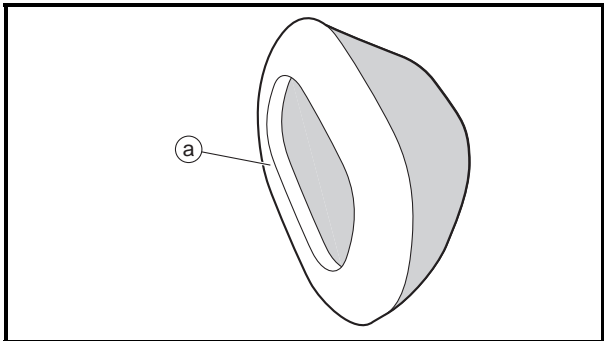
- c. Apply Yamaha foam air filter oil or other quality foam air filter oil (not spray type).
 d. Squeeze out the excess oil.

NOTE: _____

The element should be wet but not dripping.



6. Install:
- air filter element frame



7. Apply:
- Lithium-soap-based grease
 On the matching surface (a) on air filter element.

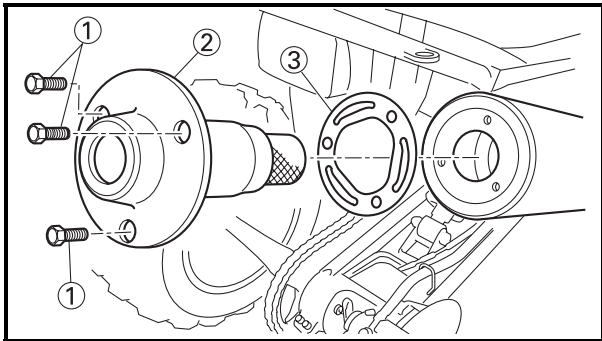
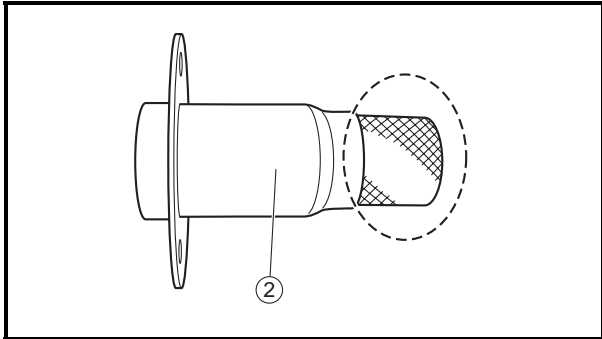
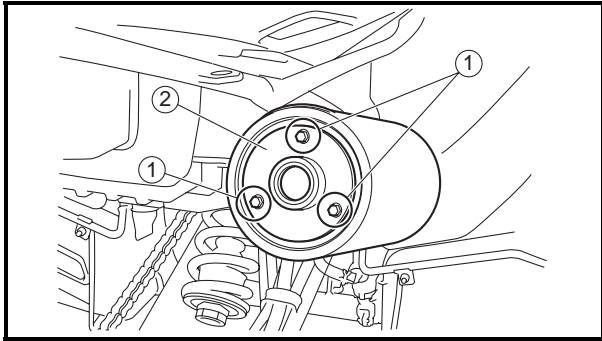
8. Install:
- air filter element
 - wing bolt

NOTE: _____

Make sure its sealing surface matches the sealing surface of the case so there is no air leak.

9. Install:
- air filter case cover

10. Install:
- seat
 Refer to “SEAT, FENDERS AND FUEL TANK”.



CLEANING THE SPARK ARRESTER

1. Clean:
- Spark arrester

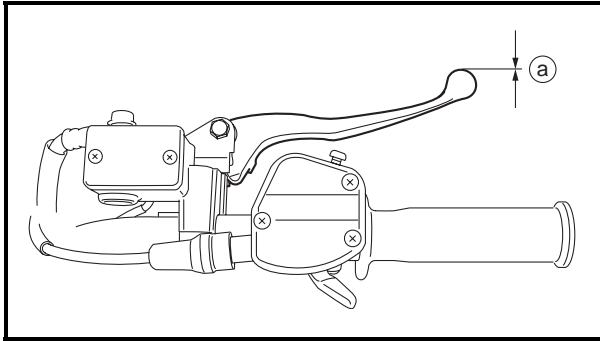


⚠ WARNING

- Select a well-ventilated area free of combustible materials.
- Always let the exhaust system cool before performing this operation.
- Do not start the engine when removing the tailpipe from the muffler.

- Remove the bolts ①.
- Remove the tailpipe ② from the muffler.
- Tap the tailpipe lightly with a soft-face hammer or suitable tool, then use a wire brush to remove any carbon deposits from the spark arrester portion of the tailpipe and the inner contact surfaces of the muffler.
- Insert the tailpipe and gasket ③ into the muffler.
- Install the bolts and tighten it.





EBS00080

CHASSIS

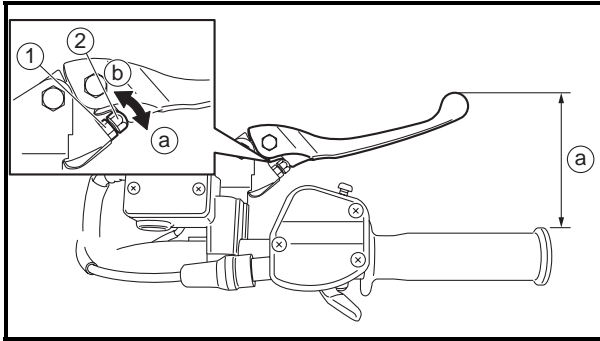
ADJUSTING THE FRONT BRAKE

1. Measure:

- brake lever free play (a)
- Out of specification → Bleed the front brake system.
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM”.



**Brake lever free play
(at the end of the brake lever)**
0 mm (0 in)



**ADJUSTING THE BRAKE LEVER
(For adjustment type model)**

1. Adjust:

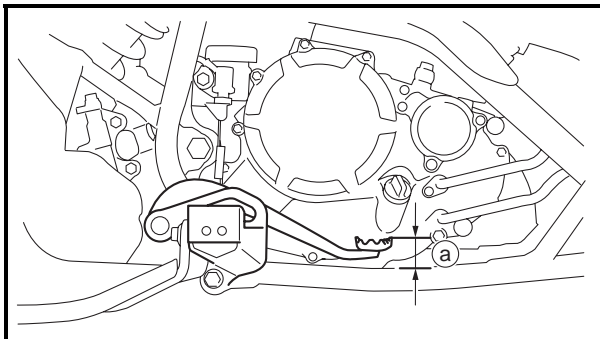
- brake lever position (a)



- a. While pushing the brake lever forward, loosen the locknut (1).
- b. While pushing the brake lever forward, turn the adjusting bolt (2) in direction (b) or (c) until the brake lever is in the desired position.
- c. Tighten the locknut.

CAUTION:

Be sure to tighten the locknut, as failing to do so will cause poor brake performance.



EBS00085

ADJUSTING THE REAR BRAKE

1. Measure:

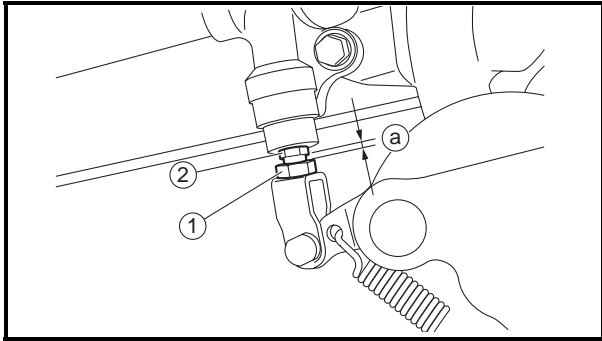
- rear brake pedal height (a)
- Out of specification → Adjust.



Rear brake pedal height
40.0 mm (1.57 in)

**ADJUSTING THE REAR BRAKE/
ADJUSTING THE PARKING BRAKE**

**CHK
ADJ**



2. Adjust:
- rear brake pedal height



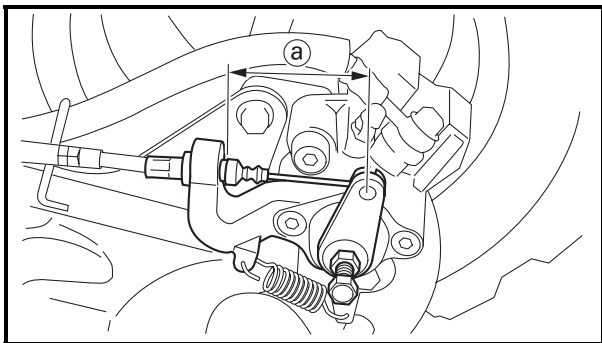
- a. Loosen the locknut ①.
- b. Turn the adjusting bolt ② until the brake pedal height is within the specified limits.
- c. Tighten the locknut.

NOTE: _____

When adjusting the brake pedal height make sure the locknut-to-adjusting bolt clearance (a) does not exceed 2.2 ~ 3.2 mm (0.09 ~ 0.13 in).

⚠ WARNING _____

After this adjustment is performed, lift the front and rear wheels off the ground by placing a block under the engine, and spin the rear wheels to ensure there is no brake drag. If any brake drag is noticed, perform the above steps again.



ADJUSTING THE PARKING BRAKE

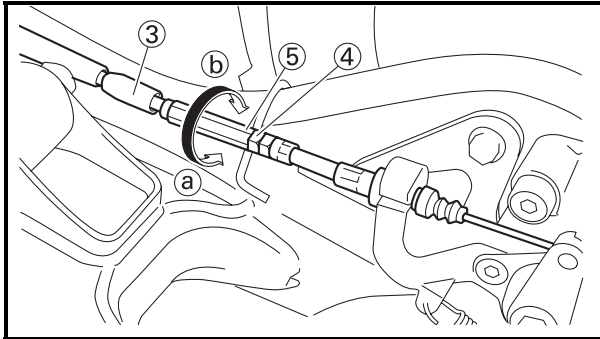
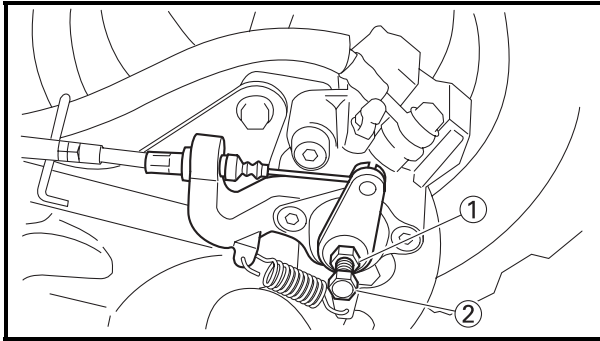
1. Check:
- parking brake cable end length (a)
Out of specification → Adjust.



**Parking brake cable end length
64 ~ 68 mm (2.52 ~ 2.68 in)**

ADJUSTING THE PARKING BRAKE/ CHECKING THE BRAKE FLUID LEVEL

CHK
ADJ



2. Adjust:

- parking brake cable end length



- Loosen the locknut (1) and adjusting bolt (2).
- Slide back the rubber cover (3).
- Loosen the locknut (4).
- Turn the adjusting nut (5) in direction (a) or (b) until the specified brake cable end length is obtained.
- Tighten the locknut.
- Slowly turn the adjusting bolt clockwise until resistance is felt.
- Turn it 1/8 counterclockwise.
- Tighten the locknut (1).

16 Nm (1.6 m•kg, 11 ft•lb)

- Slide the rubber cover to its original position.

⚠ WARNING

After this adjustment is performed, lift the rear wheels off the ground by placing a block under the engine, and spin the rear wheels to ensure there is no brake drag. If any brake drag is noticed perform the above steps again.



EBS00087

CHECKING THE BRAKE FLUID LEVEL

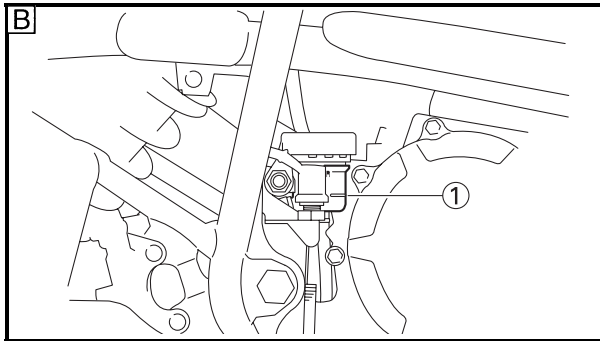
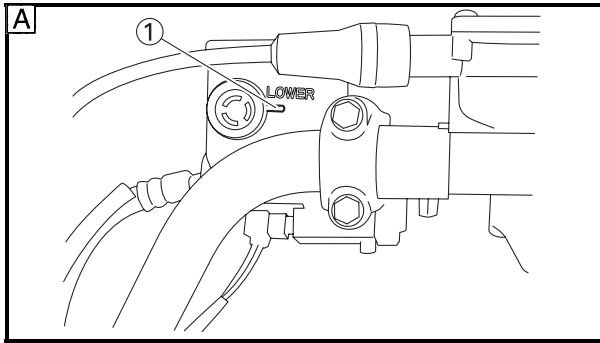
- Place the machine on a level surface.

NOTE: _____

When checking the brake fluid level, make sure that the top of the brake master cylinder reservoir or brake fluid reservoir is horizontal.

CHECKING THE BRAKE FLUID LEVEL/ CHECKING THE FRONT BRAKE PADS

CHK
ADJ



2. Check:

- brake fluid level
Below the minimum level mark ① → Add the recommended brake fluid to the proper level.



Recommended brake fluid
DOT 4

- A** Front brake
- B** Rear brake

⚠ WARNING

- Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.
- Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.
- When refilling, be careful that water does not enter the brake fluid reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.

CAUTION:

Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

NOTE:

In order to ensure a correct reading of the brake fluid level, make sure that the top of the brake master cylinder reservoir or brake fluid reservoir is horizontal.

EBS00088

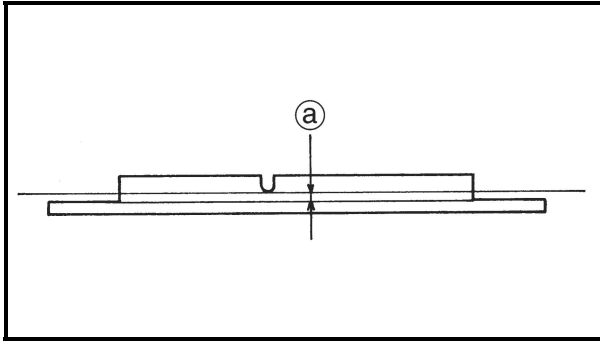
CHECKING THE FRONT BRAKE PADS

1. Remove:

- front wheels
Refer to "FRONT AND REAR WHEELS" in chapter 6.

CHECKING THE FRONT BRAKE PADS/ CHECKING THE REAR BRAKE PADS

CHK
ADJ



2. Check:

- brake pads

Wear indicator groove almost disappeared

Ⓐ → Replace the brake pads as a set.

Refer to “FRONT AND REAR BRAKES” in chapter 6.



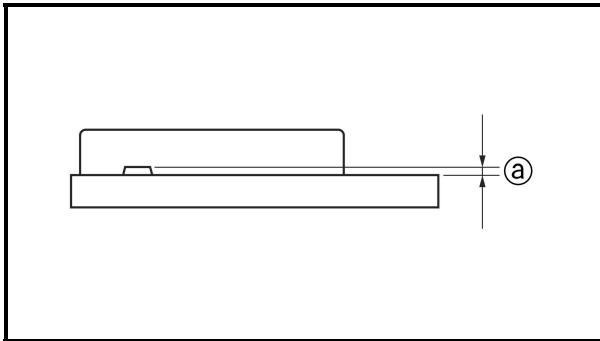
Brake pad wear limit Ⓐ
1.5 mm (0.06 in)

3. Operate the brake lever.

4. Install:

- front wheels

Refer to “FRONT AND REAR WHEELS” in chapter 6.



EBS00089

CHECKING THE REAR BRAKE PADS

1. Check:

- brake pads

Wear indicators almost touch the brake disc

Ⓐ → Replace the brake pads as a set.

Refer to “FRONT AND REAR BRAKES” in chapter 6.

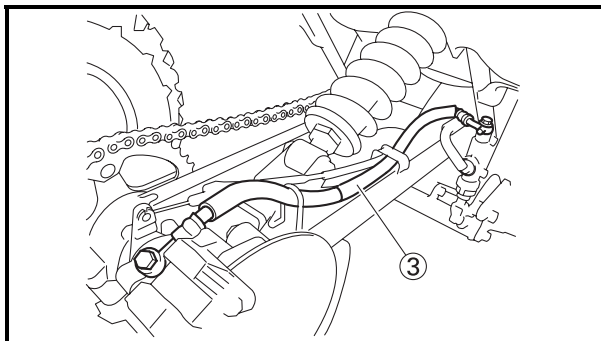
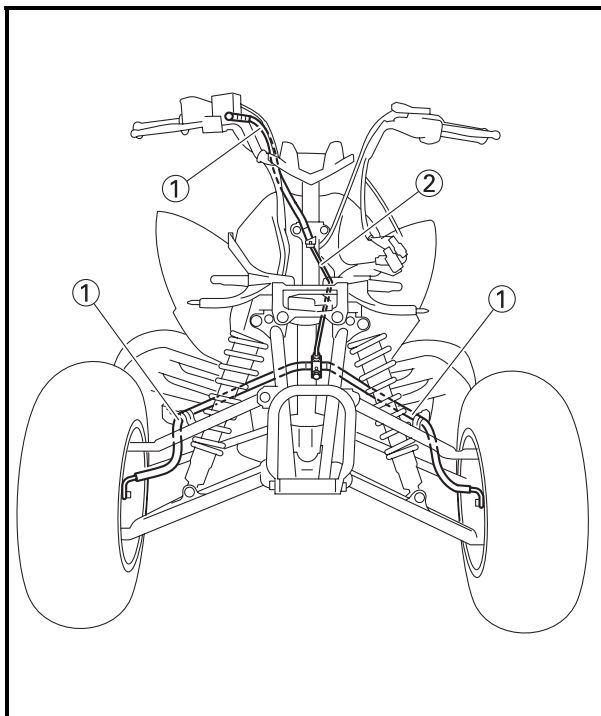


Brake pad wear limit Ⓐ
1.0 mm (0.04 in)

2. Operate the brake pedal.

CHECKING THE BRAKE HOSES/ BLEEDING THE HYDRAULIC BRAKE SYSTEM

CHK
ADJ



2. Check:
 - front brake hoses ①
 - front brake pipe ②
 - rear brake hose ③Cracks/wear/damage → Replace.
3. Check:
 - brake hose clampsLoosen → Tighten.
4. Hold the machine in an upright position and apply the front or rear brake.
5. Check:
 - brake hosesApply the brake lever or brake pedal several times.
Fluid leakage → Replace the hoses or pipe.
Refer to “FRONT AND REAR BRAKES” in chapter 6.
6. Install:
 - front fender
 - seatRefer to “SEAT, FENDERS AND FUEL TANK”.

EBS00094

BLEEDING THE HYDRAULIC BRAKE SYSTEM

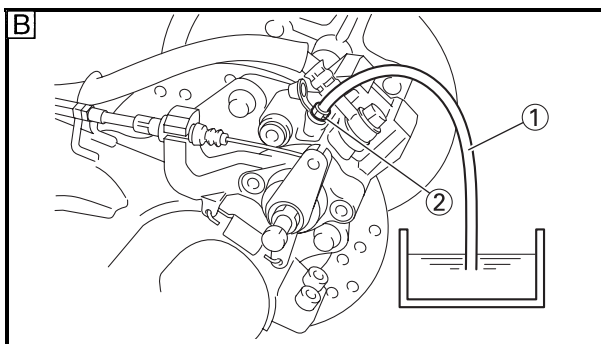
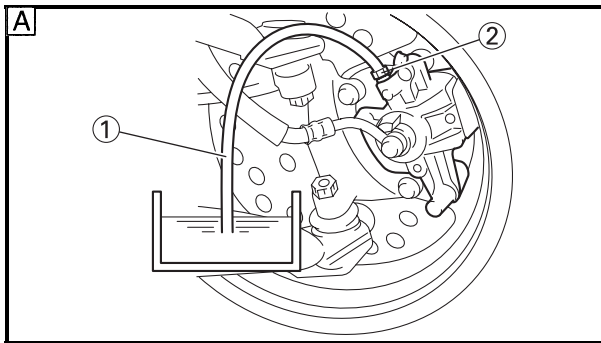
⚠ WARNING

Bleed the hydraulic brake system whenever:

- the system is disassembled.
- a brake hose is loosened, disconnected or replaced.
- the brake fluid level is very low.
- brake operation is faulty.

NOTE: _____

- Be careful not to spill any brake fluid or allow the brake master cylinder reservoir or brake fluid reservoir to overflow.
- When bleeding the hydraulic brake system, make sure there is always enough brake fluid before applying the brake. Ignoring this precaution could allow air to enter the hydraulic brake system, considerably lengthening the bleeding procedure.
- If bleeding is difficult, it may be necessary to let the brake fluid settle for a few hours. Repeat the bleeding procedure when the tiny bubbles in the hose have disappeared.



1. Bleed:
 - hydraulic brake system



- a. Fill the brake fluid reservoir to the proper level with the recommended brake fluid.
- b. Install the diaphragm (brake master cylinder reservoir or brake fluid reservoir).
- c. Connect a clear plastic hose (1) tightly to the bleed screw (2).

A Front

B Rear

- d. Place the other end of the hose into a container.
- e. Slowly apply the brake lever or brake pedal several times.
- f. Fully squeeze the brake lever or fully depress the brake pedal and hold it in position.
- g. Loosen the bleed screw.

NOTE: _____

Loosening the bleed screw will release the pressure and cause the brake lever to contact the grip or the brake pedal to fully extend.

- h. Tighten the bleed screw and then release the brake lever or brake pedal.
- i. Repeat steps (e) to (h) until all of the air bubbles have disappeared from the brake fluid in the plastic hose.



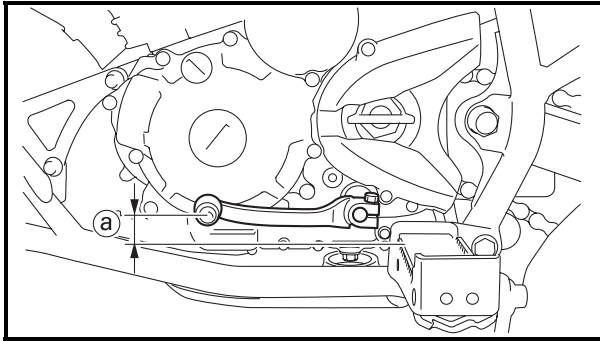
- j. Tighten the bleed screw to specification.

5 Nm (0.5 m•kg, 3.7 ft•lb)

- k. Fill the brake fluid reservoir to the proper level with the recommended brake fluid. Refer to “CHECKING THE BRAKE FLUID LEVEL”.

⚠ WARNING

After bleeding the hydraulic brake system, check the brake operation.



EBS00098

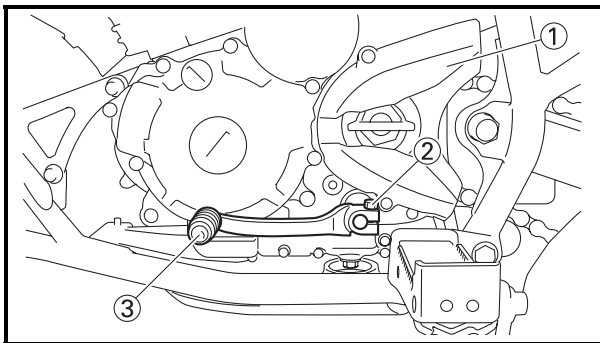
ADJUSTING THE SHIFT PEDAL

1. Measure:

- shift pedal height **a**
Out of specification → Adjust.



**Shift pedal height
15.2 mm (0.60 in)**



2. Adjust:
- shift pedal position



- Remove the drive sprocket cover **1**. Refer to “REAR SHOCK ABSORBER, SWINGARM AND DRIVE CHAIN” in chapter 6.
- Remove the bolt **2**.
- Remove the shift pedal **3**.
- Install the shift pedal at the correct height.
- Tighten the bolt to specification.

10 Nm (1.0 m•kg, 7.4 ft•lb)



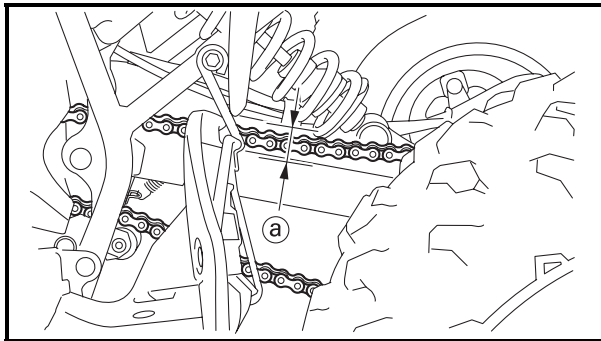
ADJUSTING THE DRIVE CHAIN SLACK

NOTE:

- Measure the drive chain slack halfway between the drive axle and the rear axle.
- When checking and adjusting the drive chain slack, there should be no weight on the vehicle and all tires must be touching the ground.

CAUTION:

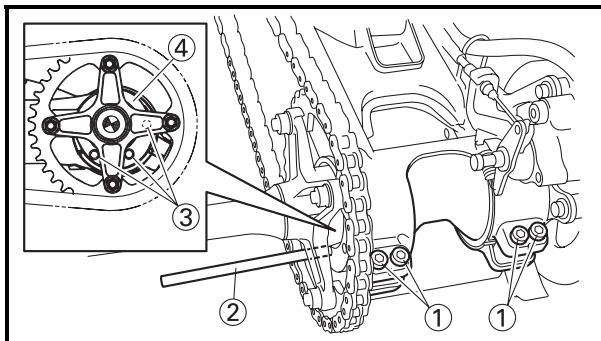
A drive chain that is too tight will overload the engine and other vital parts, and one that is too loose can skip and damage the swingarm or cause an accident. Therefore, keep the drive chain slack within the specified limits.



1. Measure:
 - drive chain slack (a)
 Out of specification → Adjust.



Drive chain slack
45 ~ 55 mm (1.77 ~ 2.17 in)

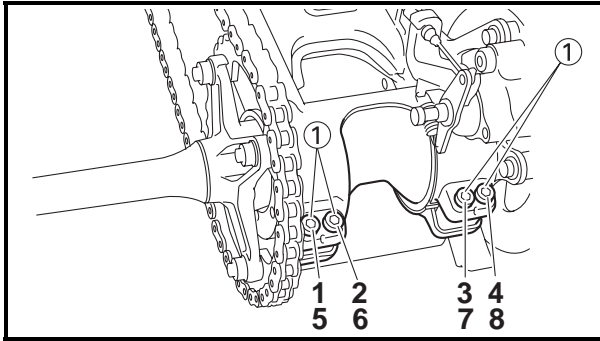


2. Adjust:
 - drive chain slack

NOTE:

The drive chain slack is adjusted by the rotation of the rear axle hub.

- a. Loosen the rear axle pinch bolts (1).
- b. Insert a rod of a diameter of 8 mm (0.31 in) and length of 10 cm (4 in) (2) in the hole (3) of rear axle hub (4).
- c. Shift the transmission into the neutral position.
- d. To loosen the drive chain, push the vehicle forward and to tighten the drive chain, pull the vehicle backward.



CAUTION:

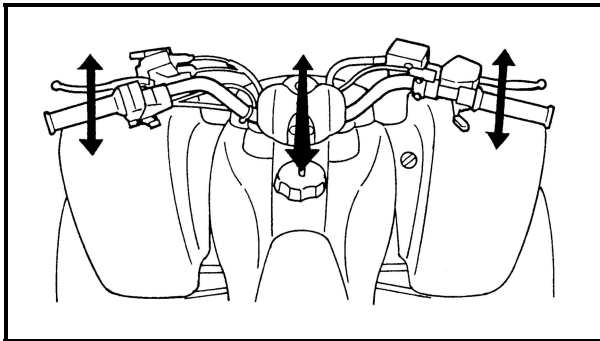
Excessive chain slack will overload the engine and other vital parts; keep the slack within the specified limits.

- e. If the chain slack cannot be adjusted, replace the sprockets and drive chain as a set.
- f. Tighten the rear axle pinch bolts ①.

21 Nm (2.1 m•kg, 15 ft•lb)

NOTE:

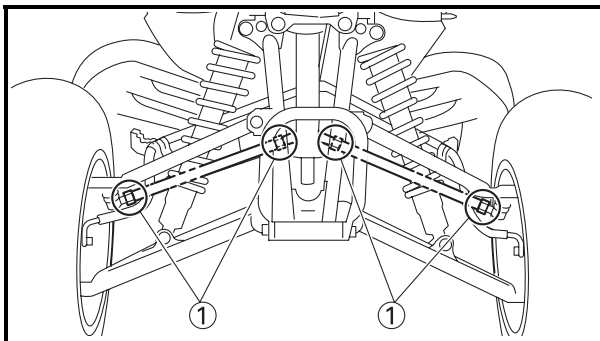
- Tighten the rear axle pinch bolts ① in the proper sequence as shown.
- The chain should be cleaned and lubricated after every use of the vehicle.



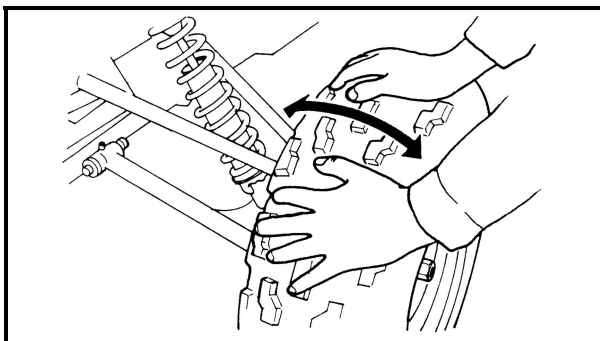
EBS00106

CHECKING THE STEERING SYSTEM

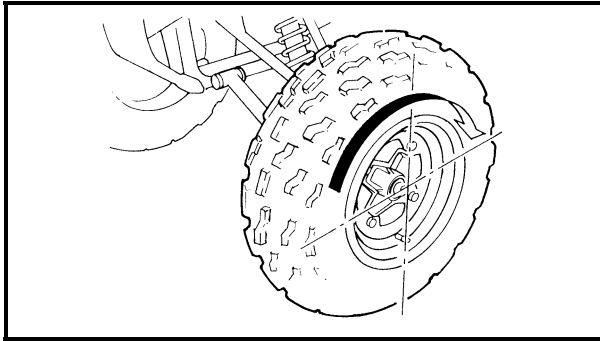
1. Place the machine on a level surface.
2. Check:
 - steering assembly bushings
Move the handlebar up and down, and/or back and forth.
Excessive play → Replace the steering stem bushings.



3. Check:
 - tie-rod ends
Turn the handlebar to the left and right until it stops completely, and then move the handlebar slightly in the opposite direction.
Tie-rod end(s) ① have vertical play → Replace the tie-rod end(s).



4. Raise the front end of the machine so that there is no weight on the front wheels.
5. Check:
 - ball joints and/or wheel bearings
Move the wheels laterally back and forth.
Excessive free play → Replace the front arms (upper and lower) and/or wheel bearings.



EBS00108

ADJUSTING THE TOE-IN

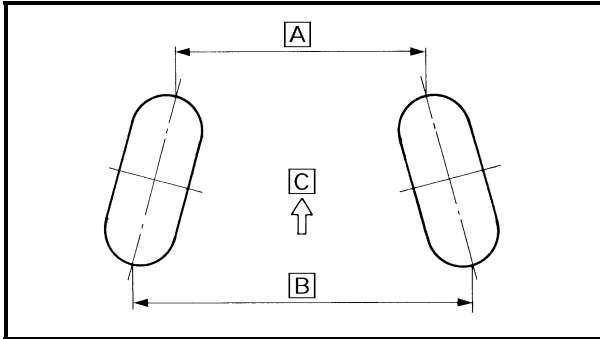
1. Place the machine on a level surface.
2. Measure:
 - toe-in
 Out of specification → Adjust.

	Toe-in 9 ~ 19 mm (0.35 ~ 0.75 in)
--	--



NOTE:

Before measuring the toe-in, make sure that the tire pressure is correct.



- a. Mark both front tire tread centers.
- b. Face the handlebar straight ahead.
- c. Measure the width **A** between the marks.
- d. Rotate the front tires 180° until the marks are exactly opposite one another.
- e. Measure the width **B** between the marks.
- f. Calculate the toe-in using the formula given below.

Toe-in = $B - A$

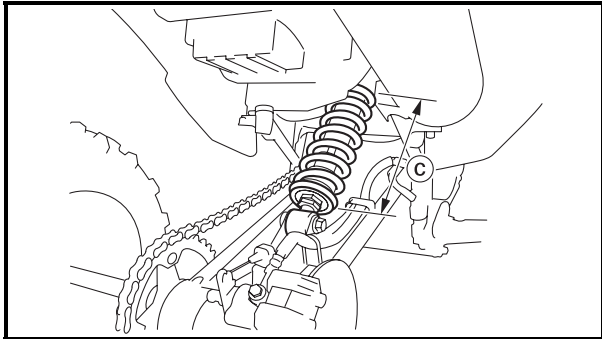
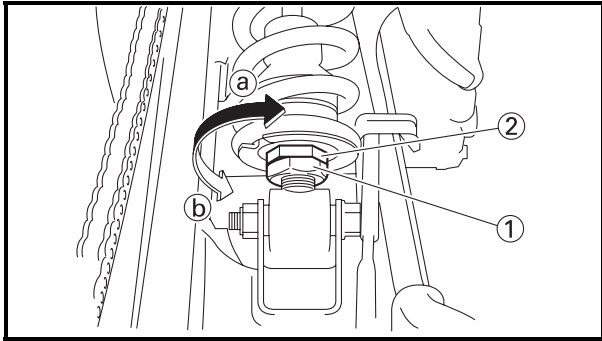
- g. If the toe-in is incorrect, adjust it.
 - C** Forward



3. Adjust:
 - toe-in

⚠ WARNING

- Be sure that both tie-rods are turned the same amount. If not, the machine will drift right or left even though the handlebar is positioned straight. This may lead to mis-handling and an accident.
- After setting the toe-in to specification, run the machine slowly for some distance with both hands lightly holding the handlebar and check that the handlebar responds correctly. If not, turn either the right or left tie-rod within the toe-in specification.



EBS00111

ADJUSTING THE REAR SHOCK ABSORBER

1. Adjust:
 - spring preload



- a. Elevate the rear wheels by placing a suitable stand under the frame.
- b. Loosen the locknut ①.
- c. Turn the adjusting nut ② in direction ③ or ④.

Direction ③	Spring preload is increased (suspension is harder).
Direction ④	Spring preload is decreased (suspension is softer).

<p>Adjusting length ⑤ Standard: 230 mm (9.06 in) Minimum: 222 mm (8.74 in) Maximum: 234 mm (9.21 in)</p>
--


NOTE: _____

- Be sure to remove all dirt and mud from around the locknut and adjusting nut before adjustment.
- The length of the spring (installed) changes 1.0 mm (0.04 in) per turn of the adjuster.

CAUTION: _____

Never attempt to turn the adjusting ring beyond the maximum or minimum setting.

- d. Tighten the locknut.

 42 Nm (4.2 m•kg, 31 ft•lb)

NOTE: _____

Always tighten the locknut against the adjusting nut, then torque it to specification.





EBS00114

CHECKING THE TIRES

⚠ WARNING

This model is equipped with low pressure tires. It is important that they be inflated correctly and maintained at the proper pressures.

• TIRE CHARACTERISTICS

- 1) Tire characteristics influence the handling of ATVs. The tires listed below have been approved by Yamaha Motor Co., Ltd. for this model. If other tire combinations are used, they can adversely affect your machine's handling characteristics and are therefore not recommended.

	Manufacturer	Size	Type
Front	DUNLOP	AT20 × 7-10	KT201
Rear	DUNLOP	AT19 × 10-9	KT205A

• TIRE PRESSURE

- 1) Recommended tire pressure
Front 27.5 kPa (0.28 kg/cm², 4.0 psi)
Rear 27.5 kPa (0.28 kg/cm², 4.0 psi)
- 2) Tire pressure below the minimum specification could cause the tire to dislodge from the rim under severe riding conditions.

The following are minimums:

Front 24.5 kPa (0.25 kg/cm², 3.6 psi)

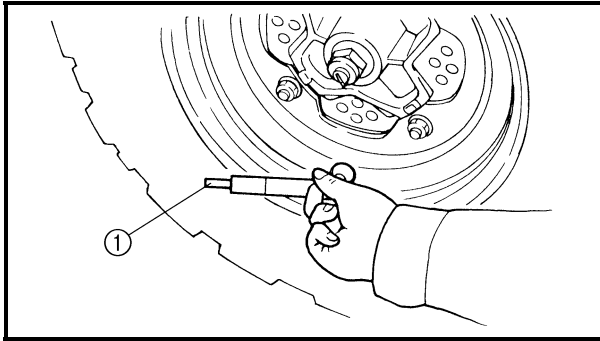
Rear 24.5 kPa (0.25 kg/cm², 3.6 psi)

- 3) Use no more than
Front 250 kPa (2.6 kg/cm², 36 psi)
Rear 250 kPa (2.6 kg/cm², 36 psi)
when seating the tire beads. Higher pressures may cause the tire to burst. Inflate the tires slowly and carefully. Fast inflation could cause the tire to burst.

• MAXIMUM LOADING LIMIT

- 1) Vehicle load limits: 100 kg (220 lb)
*Total weight of the cargo, rider, and accessories.

Be extra careful of the machine balance and stability when towing a trailer.



1. Measure:
 - tire pressure
 - Out of specification → Adjust.

NOTE: _____

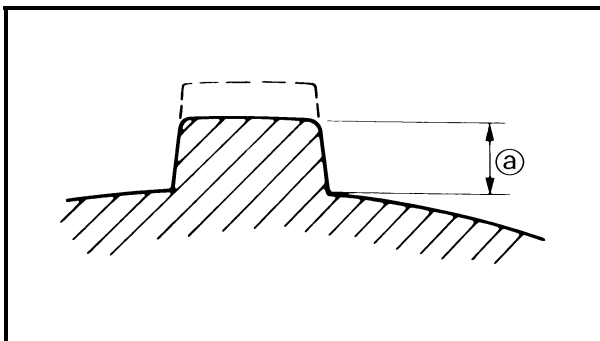
- The low-pressure tire gauge ① is included as standard equipment.
- If dust or the like is stuck to this gauge, it will not provide the correct readings. Therefore, take two measurements of the tire's pressure and use the second reading.

Cold tire pressure	Front/Rear
Standard	27.5 kPa (0.28 kg/cm ² , 4.0 psi)
Minimum	24.5 kPa (0.25 kg/cm ² , 3.6 psi)
Maximum	30.5 kPa (0.31 kg/cm ² , 4.4 psi)


⚠ WARNING _____

Uneven or improper tire pressure may adversely affect the handling of this machine and may cause loss of control.

- Maintain proper tire pressures.
- Set tire pressures when the tires are cold.
- Tire pressures must be equal in both front tires and equal in both rear tires.

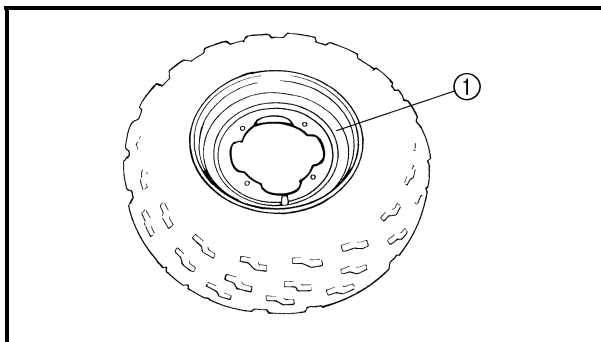


2. Check:
 - tire surfaces
 - Wear/damage → Replace.

	Tire wear limit ① Front and rear: 3.0 mm (0.12 in)
---	---

⚠ WARNING _____

It is dangerous to ride with a worn-out tire. When tire wear is out of specification, replace the tire immediately.



EBS00116

CHECKING THE WHEELS

1. Check:
 - wheel ①
Damage/bends → Replace.

NOTE: _____

Always balance the wheel when a tire or wheel has been changed or replaced.

⚠ WARNING _____

- Never attempt even small repairs to the wheel.
- Ride conservatively after installing a tire to allow it to seat itself properly on the rim.

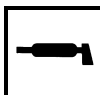
EBS00117

CHECKING AND LUBRICATING THE CABLES

⚠ WARNING _____

A damaged cable sheath may cause corrosion and interfere with the cable movement. An unsafe condition may result so replace a damaged cable as soon as possible.

1. Check:
 - cable sheath
Damage → Replace.
2. Check:
 - cable operation
Unsmooth operation → Lubricate or replace.



Recommended lubricant
Yamaha chain and cable lube or engine oil

NOTE: _____


Hold the cable end up and apply several drops of lubricant to the cable.

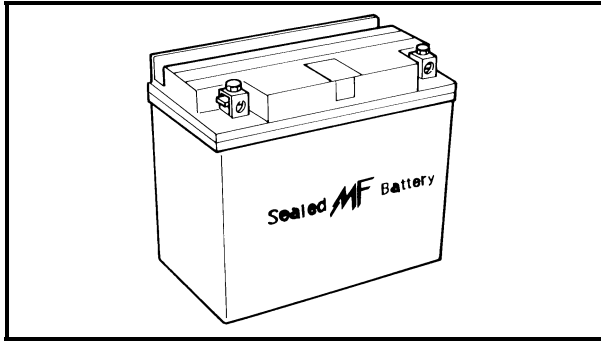
3. Apply:
 - Lithium-soap-based grease
(onto end of the cable)

EBS00118

LUBRICATING THE LEVERS AND PEDALS

Lubricate the pivoting point and metal-to-metal moving parts of the levers and pedal.

	Recommended lubricants
	Brake lever
	Silicone grease
	Clutch lever and brake pedal
	Lithium-soap-based grease



EBS00120

ELECTRICAL SYSTEM**CHECKING AND CHARGING THE BATTERY****⚠ WARNING**

Batteries generate explosive hydrogen gas and contain electrolyte which is made of poisonous and highly caustic sulfuric acid. Therefore, always follow these preventive measures:

- Wear protective eye gear when handling or working near batteries.
- Charge batteries in a well-ventilated area.
- Keep batteries away from fire, sparks or open flames (e.g., welding equipment, lighted cigarettes).
- **DO NOT SMOKE** when charging or handling batteries.
- **KEEP BATTERIES AND ELECTROLYTE OUT OF REACH OF CHILDREN.**
- Avoid bodily contact with electrolyte as it can cause severe burns or permanent eye injury.

**FIRST AID IN CASE OF BODILY CONTACT:
EXTERNAL**

- Skin — Wash with water.
- Eyes — Flush with water for 15 minutes and get immediate medical attention.

INTERNAL

- Drink large quantities of water or milk followed with milk of magnesia, beaten egg or vegetable oil. Get immediate medical attention.

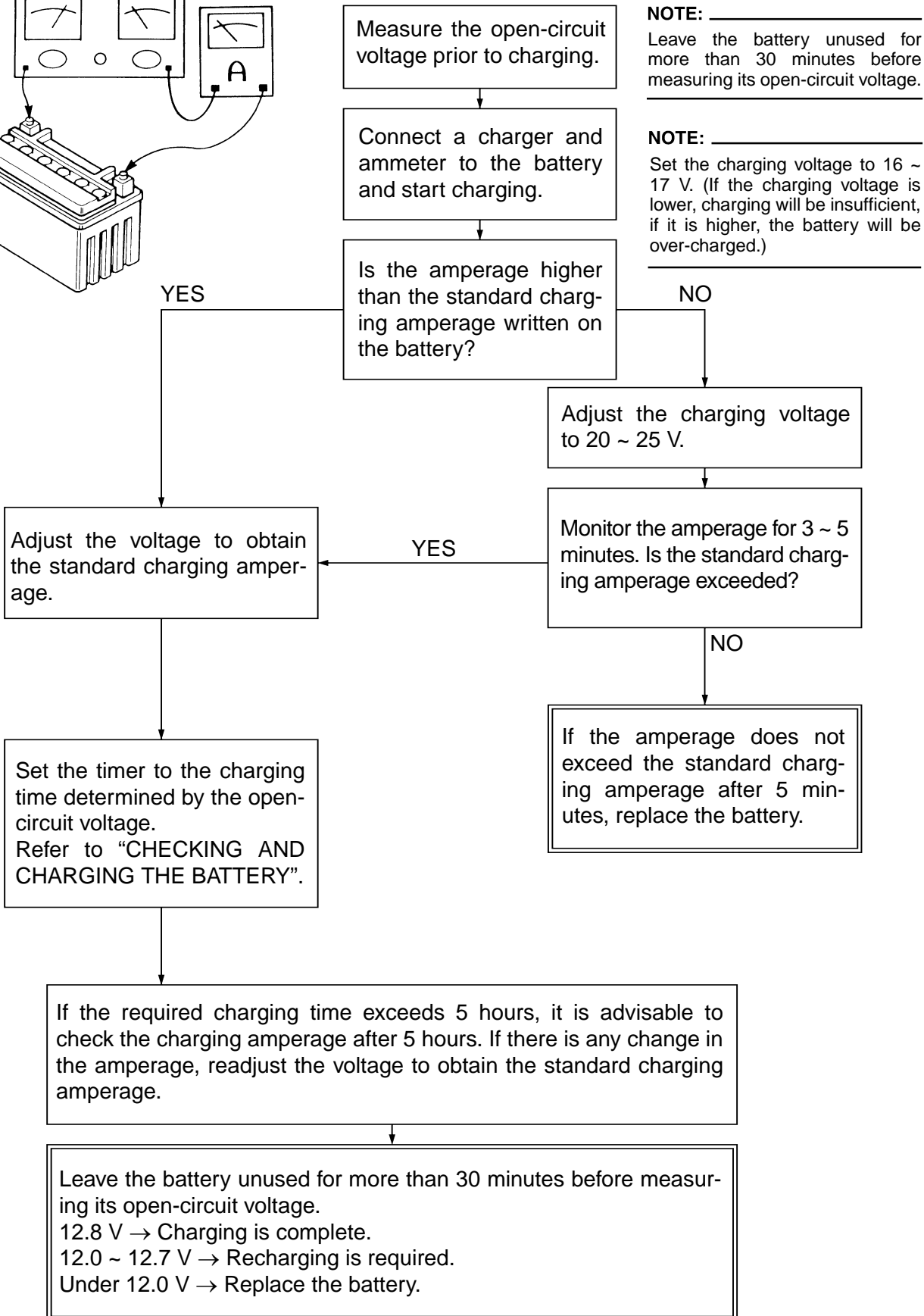
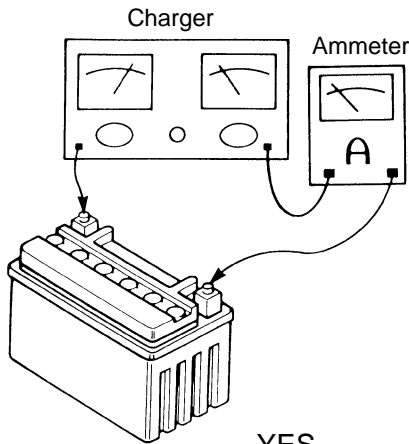
CAUTION:

- This is a sealed battery. Never remove the sealing caps because the balance between cells will not be maintained and battery performance will deteriorate.
- Charging time, charging amperage and charging voltage for an MF battery are different from those of conventional batteries. The MF battery should be charged as explained in the charging method illustrations. If the battery is overcharged, the electrolyte level will drop considerably. Therefore, take special care when charging the battery.



- As shown in the following illustration, the open-circuit voltage of an MF battery stabilizes about 30 minutes after charging has been completed. Therefore, wait 30 minutes after charging is completed before measuring the open-circuit voltage.
-

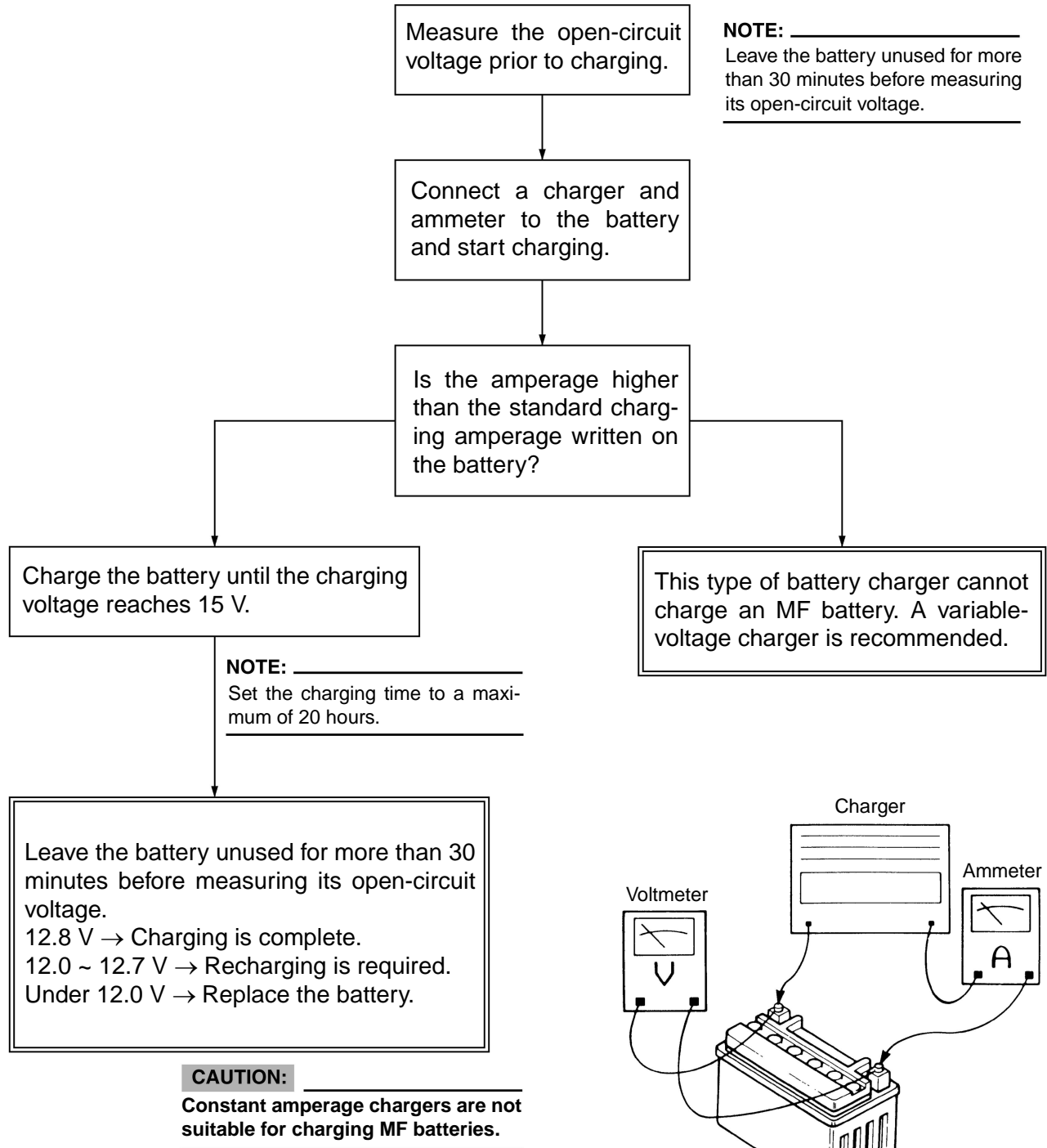
Charging method using a variable-current (voltage) charger



NOTE: _____
Leave the battery unused for more than 30 minutes before measuring its open-circuit voltage.

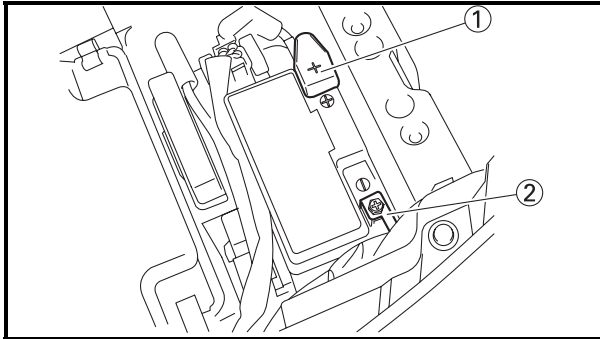
NOTE: _____
Set the charging voltage to 16 ~ 17 V. (If the charging voltage is lower, charging will be insufficient, if it is higher, the battery will be over-charged.)

Charging method using a constant voltage charger





6. Install:
- battery



7. Connect:
- battery leads
(to the battery terminals)

CAUTION:

First, connect the positive battery lead ①, and then the negative battery lead ②.

8. Check:
- battery terminals
Dirt → Clean with a wire brush.
Loose connection → Connect properly.
9. Lubricate:
- battery terminals



**Recommended lubricant
Dielectric grease**

10. Install:
- battery cover
 - seat
Refer to “SEAT, FENDERS AND FUEL TANK”.

EBS00121

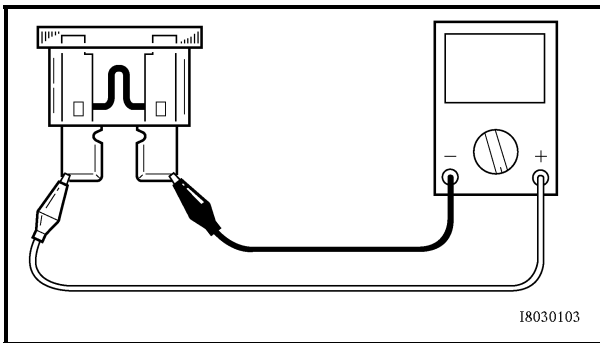
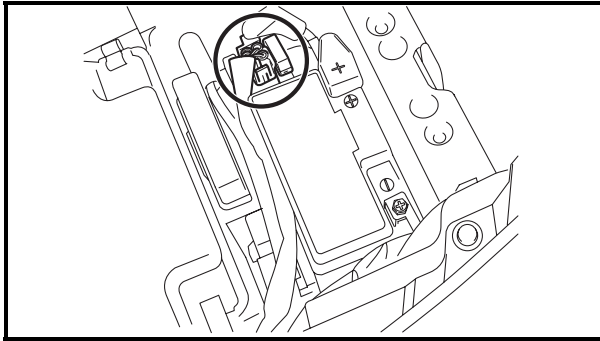
CHECKING THE FUSES

The following procedure applies to all of the fuses.

CAUTION: _____

To avoid a short circuit, always set the main switch to “OFF” when checking or replacing a fuse.

1. Remove:
 - seat
 - battery cover
 Refer to “SEAT, FENDERS AND FUEL TANK”.



2. Check:
 - fuse



- a. Connect the pocket tester to the fuse and check the continuity.

NOTE: _____

Set the pocket tester selector to “ $\Omega \times 1$ ”.



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- b. If the pocket tester indicates “•”, replace the fuse.



3. Replace:
 - blown fuse



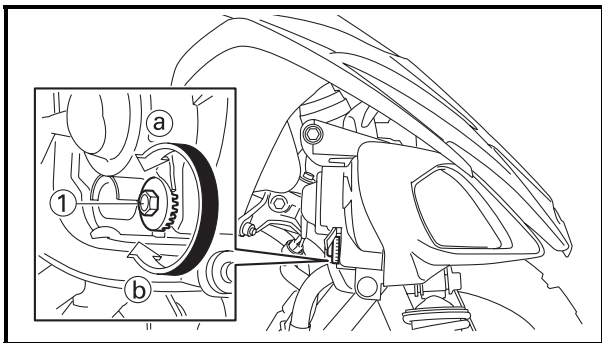
- a. Set the main switch to “OFF”.
- b. Install a new fuse of the correct amperage.
- c. Set on the switches to verify if the electrical circuit is operational.
- d. If the fuse immediately blows again, check the electrical circuit.

Items	Amperage rating	Q'ty
Main	15 A	1
Reserve	15 A	1

⚠ WARNING

Never use a fuse with an amperage rating other than that specified. Improvising or using a fuse with the wrong amperage rating may cause extensive damage to the electrical system, cause the lighting and ignition systems to malfunction and could possibly cause a fire.

-
4. Install:
- battery cover
 - seat
- Refer to "SEAT, FENDERS AND FUEL TANK".



EBS00122

ADJUSTING THE HEADLIGHT BEAM

1. Adjust:
- headlight beam (vertically)

- a. Turn the adjusting bolt ① in direction ② or ③.

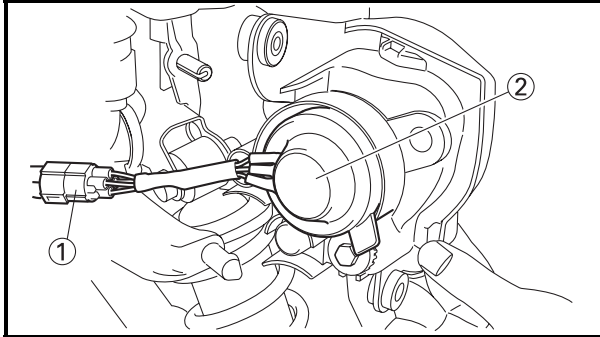
Direction ②	Headlight beam is raised.
Direction ③	Headlight beam is lowered.



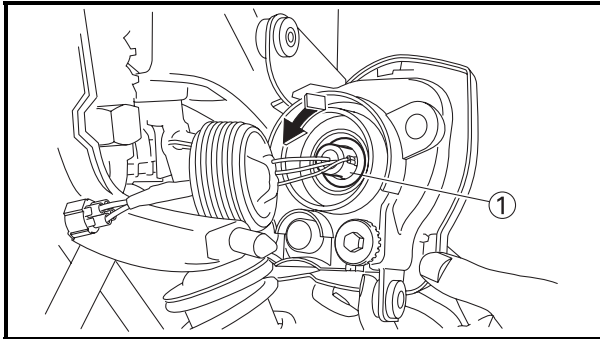
EBS00124

REPLACING A HEADLIGHT BULB

1. Remove:
 - headlight
Refer to "SEAT, FENDERS AND FUEL TANK".



2. Disconnect:
 - headlight lead coupler ①
3. Remove:
 - headlight bulb holder cover ②



4. Remove:
 - bulb holder ①
 - bulb

NOTE: _____
Push the headlight bulb holder inward, turn it counterclockwise and remove the defective bulb.

⚠ WARNING _____

Keep flammable products and your hands away from the bulb while it is on. since it will be hot. Do not touch the bulb until it cools down.

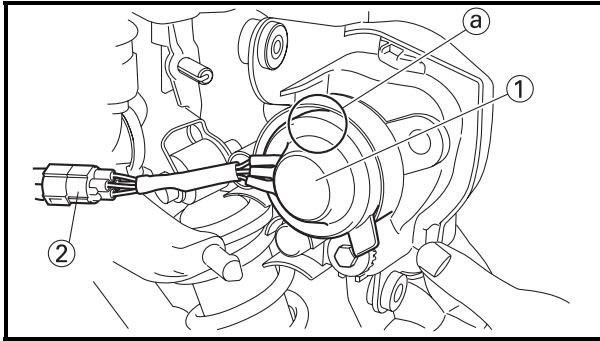
5. Install:
 - bulb **New**
Secure the new bulb with the headlight unit.

CAUTION: _____

Avoid touching the glass part of the bulb. Keep it free from oil; otherwise, the transparency of the glass, life of the bulb, and luminous flux will be adversely affected. If oil gets on the bulb, thoroughly clean it with a cloth moistened with alcohol or lacquer thinner.

REPLACING A HEADLIGHT BULB

CHK
ADJ



6. Install:
- bulb holder
 - headlight bulb holder cover ①

NOTE: _____

After installing the bulb holder cover, make sure that the "TOP" mark (a) is in the position shown.

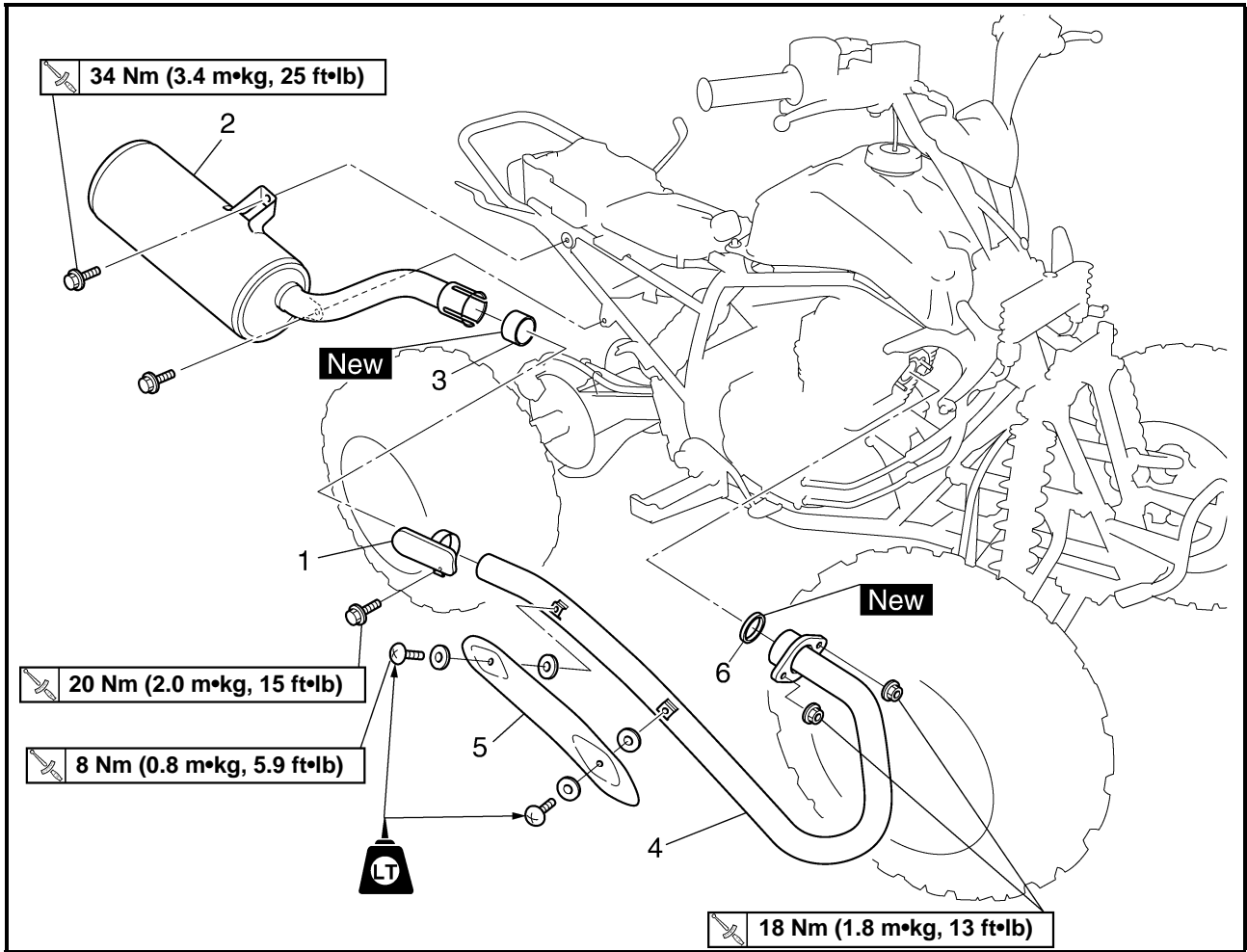
7. Connect:
- headlight lead coupler ②
8. Install:
- headlight
- Refer to "SEAT, FENDERS AND FUEL TANK".



ENGINE

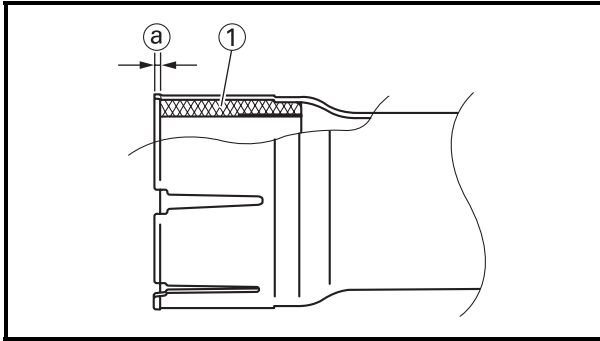
ENGINE REMOVAL

MUFFLER AND EXHAUST PIPE



4

Order	Job/Parts to remove	Q'ty	Remarks
	Removing the muffler and exhaust pipe		Remove the parts in the order listed.
	Seat/front panel/fender		Refer to "SEAT, FENDERS AND FUEL TANK" in chapter 3.
1	Clamp	1	Loosen
2	Muffler	1	
3	Gasket	1	
4	Exhaust pipe	1	
5	EXhaust pipe protector	1	
6	Gasket	1	
			For installation, reverse the removal procedure.

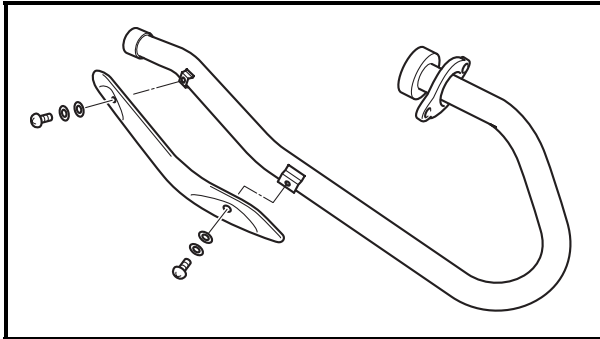


INSTALLING THE EXHAUST PIPE AND MUFFLER

1. Install:
 - gasket ① **New**
(to muffler)



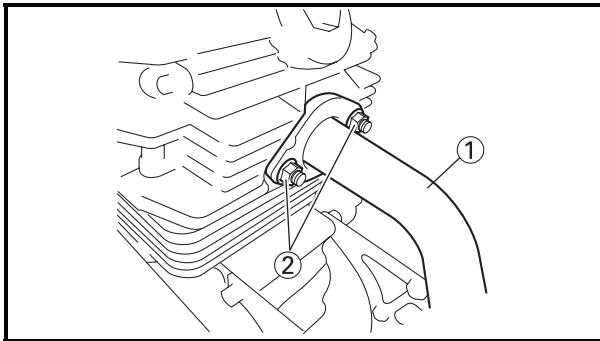
Installed depth of gasket ①
3.5 mm (0.14 in)



2. Install:
 - exhaust pipe protector
3. Tighten:
 - exhaust pipe protector screws



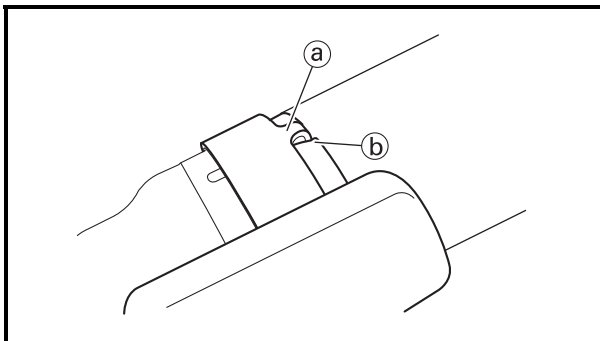
Screw
8 Nm (0.8 m•kg, 5.9 ft•lb)
LOCTITE®



4. Install:
 - gasket **New**
 - exhaust pipe ①
5. Tighten:
 - nuts (exhaust pipe) ②



Exhaust pipe nut
18 Nm (1.8 m•kg, 13 ft•lb)



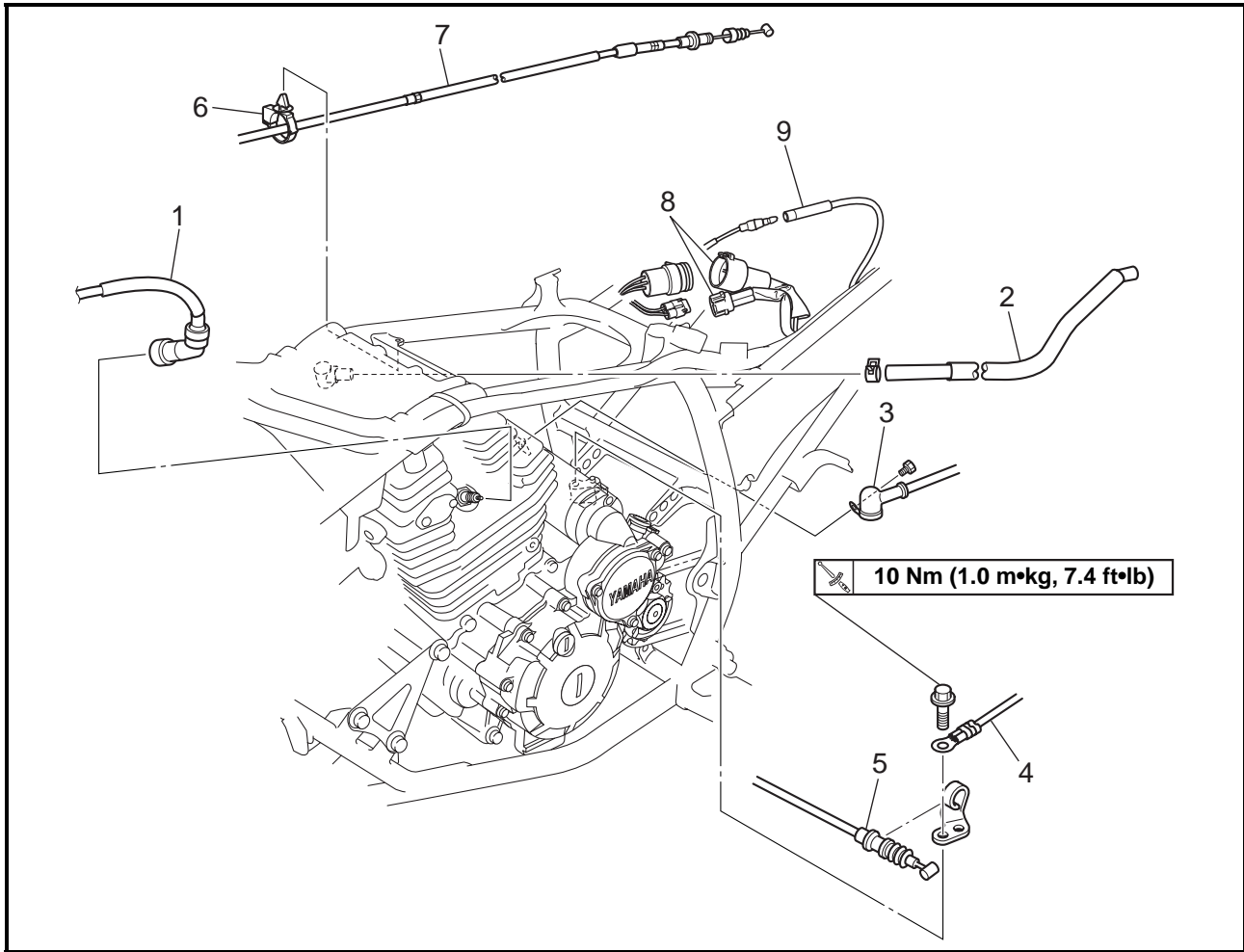
6. Install:
 - clamp

NOTE:

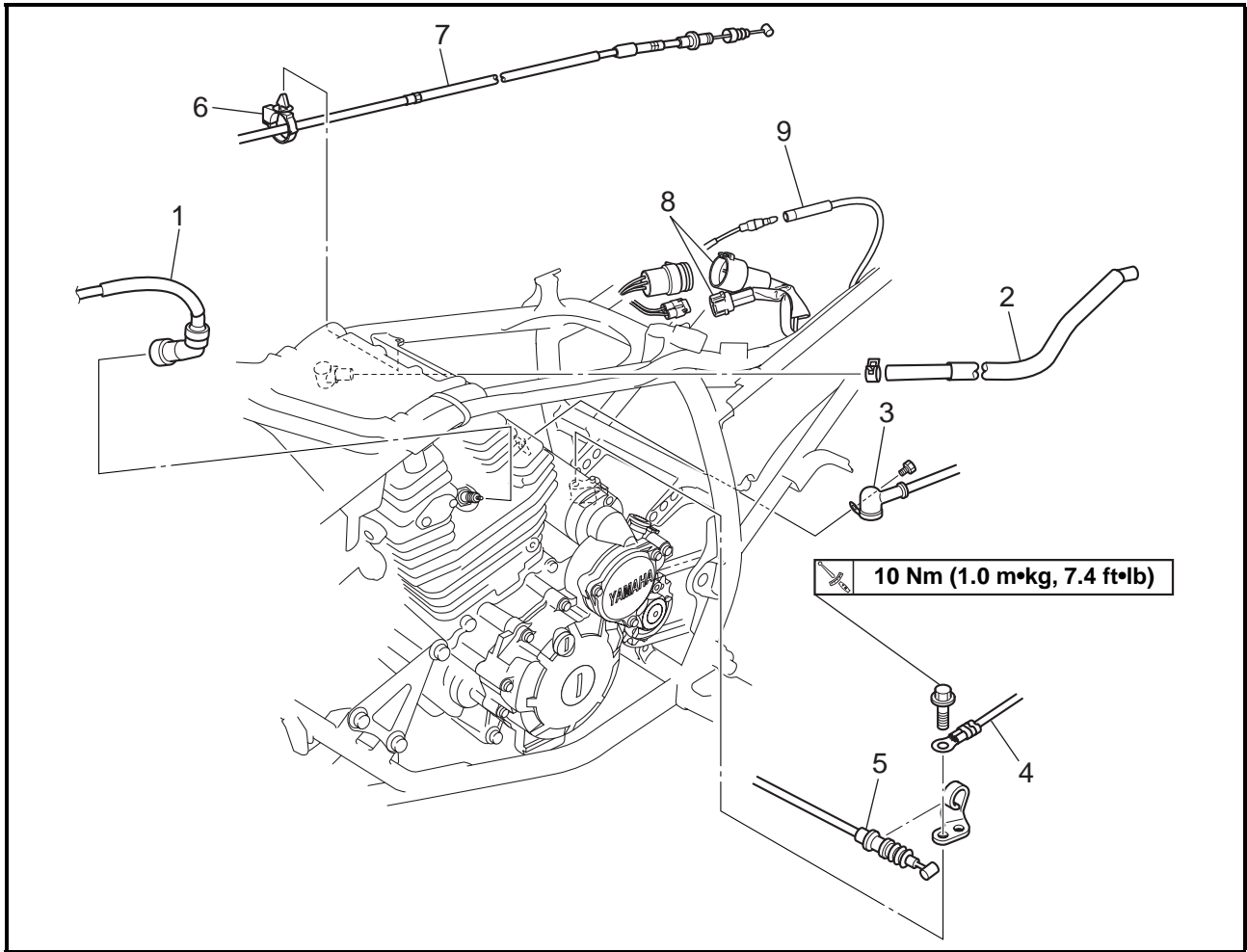
Slide the clamp onto the end of the muffler and insert the projection ① of the clamp into a slot ② in the muffler. Tighten the clamp after installing the muffler.



LEADS, CABLES AND HOSES



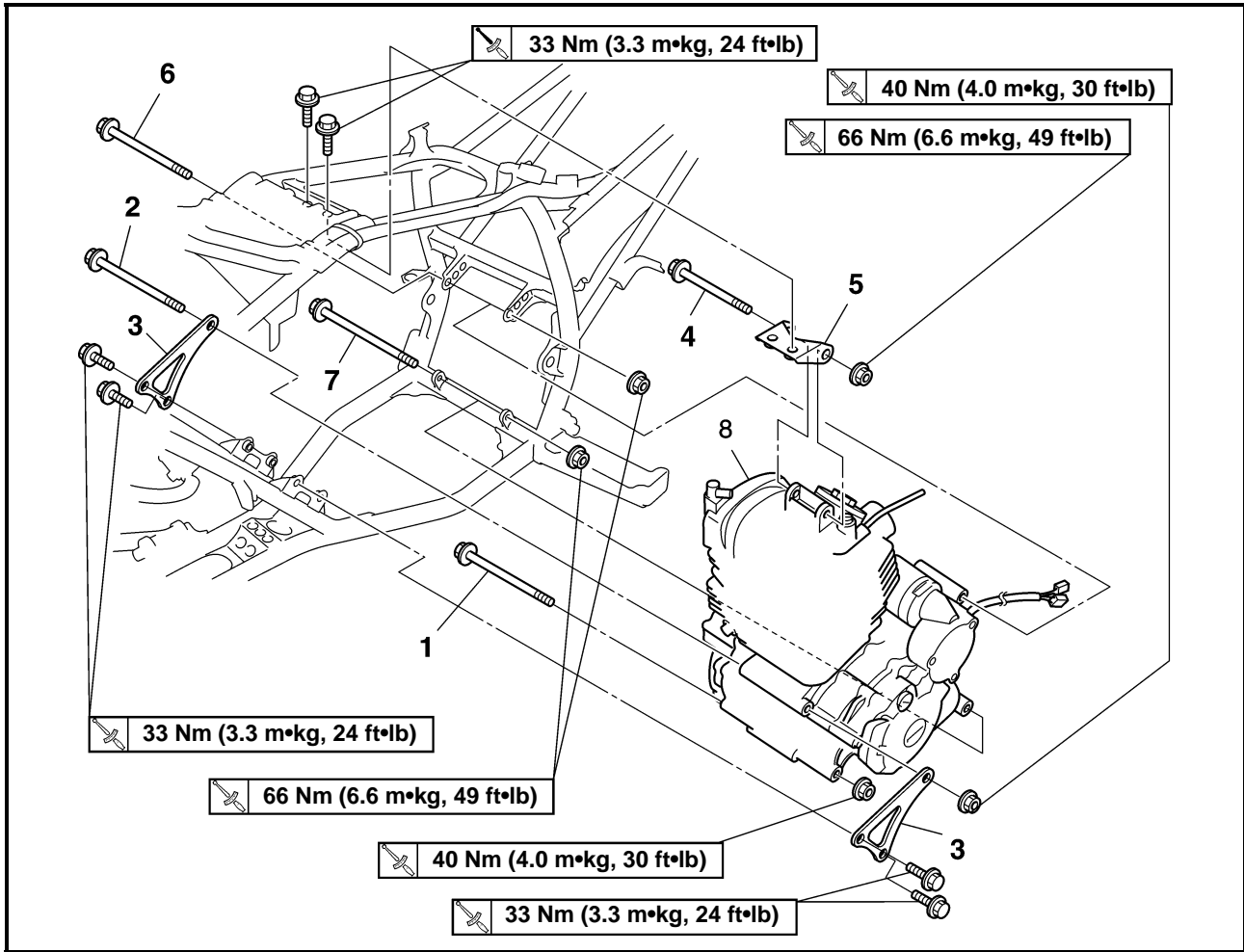
Order	Job/Parts to remove	Q'ty	Remarks
	Removing the leads, cables and hoses		Remove the parts in the order listed.
	Engine oil		Drain.
	Oil cooler hose 1, 2		Refer to "CLUTCH".
	Carburetor		Refer to "CARBURETOR" in chapter 5.
	Drive sprocket/drive chain		Refer to "REAR SHOCK ABSORBER, SWINGARM AND DRIVE CHAIN" in chapter 6.
1	Ignition coil spark plug lead	1	
2	Air filter case breather hose	1	
3	Starter motor lead	1	Disconnect.
4	Battery negative lead	1	Disconnect.
5	Clutch cable	1	
6	Plastic band	1	Disconnect.
7	Parking brake cable	1	
8	AC magneto coupler	2	Disconnect.



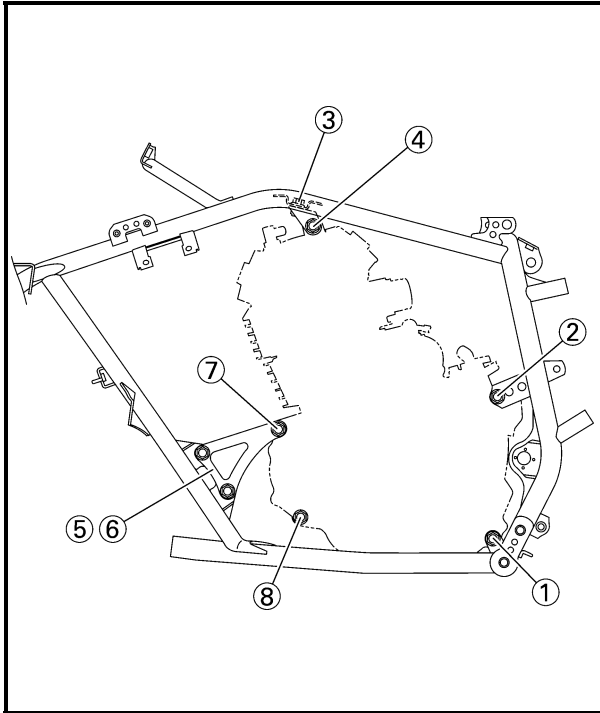
Order	Job/Parts to remove	Q'ty	Remarks
9	Neutral switch connector	1	Disconnect. For installation, reverse the removal procedure.



ENGINE MOUNTING BOLTS



Order	Job/Parts to remove	Q'ty	Remarks
	Removing the engine mounting bolts		Remove the parts in the order listed.
1	Crankcase bolt	1	
2	Engine mounting bolt (front)	1	
3	Engine bracket (left and right)	2	
4	Engine mounting bolt (upper)	1	
5	Engine bracket (upper)	1	
6	Engine mounting bolt (rear upper)	1	
7	Engine mounting bolt (rear lower)	1	
8	Engine assembly	1	
			For installation, reverse the removal procedure.



INSTALLING THE ENGINE

1. Install:
 - Engine mounting bolt (rear lower side) ①
 - Engine mounting bolt (rear upper side) ②
 - Engine bracket bolts (upper side) ③
 - Engine mounting bolt (upper side) ④
 - Engine brackets (front side) ⑤ ⑥
 - Engine mounting bolt (front side) ⑦

NOTE:

- The direction of the bolt insertion is made from the right side of the body.
- Do not fully tighten the bolts and nuts.

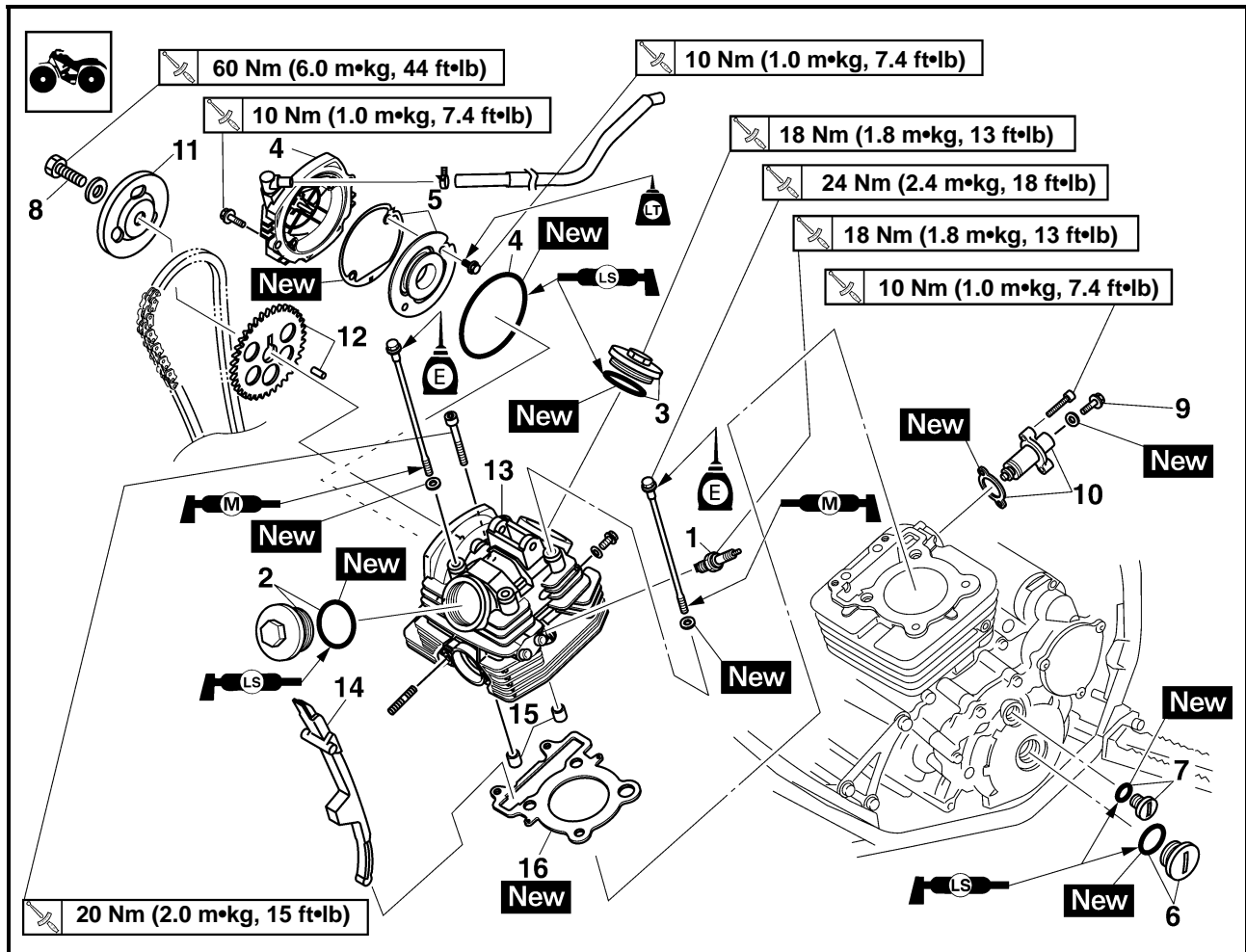
2. Install:
 - Crankcase bolt ⑧
3. Tighten:
 - Engine bracket bolts (upper side) ③
 - Engine mounting nut (rear lower side) ①
 - Engine mounting nut (rear upper side) ②
 - Engine mounting nut (upper side) ④
 - Engine mounting nut (front side) ⑦
 - Engine bracket bolts (front side)
 - Crankcase nut ⑧



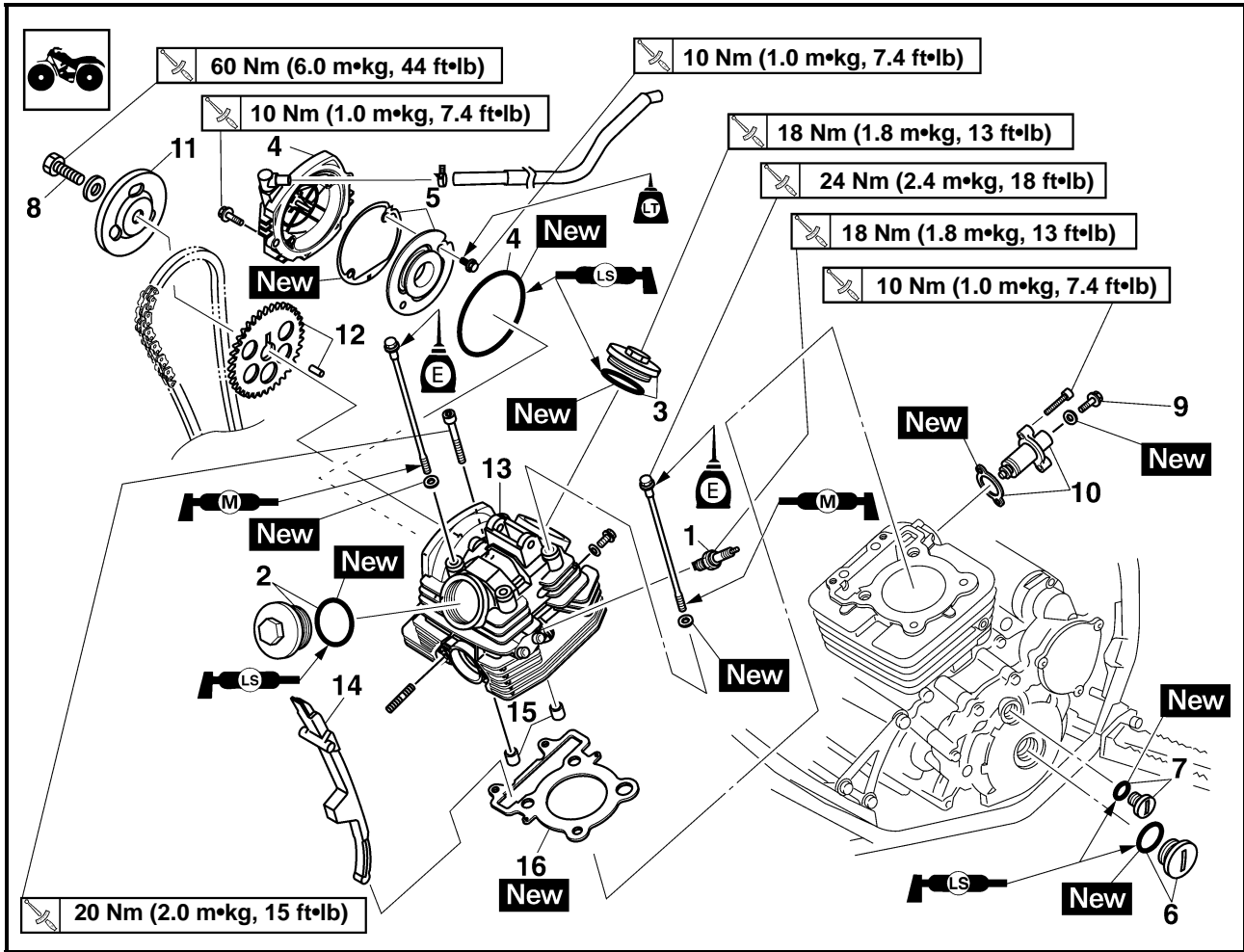
- Engine bracket bolt (upper side)**
33 Nm (3.3 m•kg, 24 ft•lb)
- Engine mounting nut (rear lower side)**
66 Nm (6.6 m•kg, 49 ft•lb)
- Engine mounting nut (rear upper side)**
66 Nm (6.6 m•kg, 49 ft•lb)
- Engine mounting nut (upper side)**
66 Nm (6.6 m•kg, 49 ft•lb)
- Engine mounting nut (front lower side)**
40 Nm (4.0 m•kg, 30 ft•lb)
- Engine bracket bolt (M8)**
33 Nm (3.3 m•kg, 24 ft•lb)
- Crankcase nut**
40 Nm (4.0 m•kg, 30 ft•lb)



CYLINDER HEAD



Order	Job/Parts to remove	Q'ty	Remarks
	Removing the cylinder head		
	Seat/front fender/fuel tank/fuel tank shield		Refer to "SEAT, FENDERS AND FUEL TANK" in chapter 3.
	Muffler and exhaust pipe		Refer to "MUFFLER AND EXHAUST PIPE".
	Carburetor		Refer to "CARBURETOR" in chapter 5.
	Ignition coil spark plug lead		Refer to "LEADS, CABLES AND HOSES".
	Engine bracket (upper side)		Refer to "ENGINE MOUNTING BOLTS".
1	Spark plug	1	
2	Cylinder head cover 1/O-ring	1/1	
3	Cylinder head cover 2/O-ring	1/1	
4	Cylinder head cover 3/O-ring	1/1	
5	Breather pipe 1/Gasket	1/1	
6	Crankshaft end accessing screw/O-ring	1/1	
7	Timing mark accessing screw/O-ring	1/1	
8	Camshaft sprocket bolt	1	Loosen.



Order	Job/Parts to remove	Q'ty	Remarks
9	Cap bolt	1	Loosen.
10	Timing chain tensioner/gasket	1/1	
11	Breather pipe 2	1	
12	Camshaft sprocket/dowel pin	1/1	
13	Cylinder head	1	
14	Timing chain guide	1	
15	Dowel pin	2	
16	Cylinder head gasket	1	
			For installation, reverse the removal procedure.



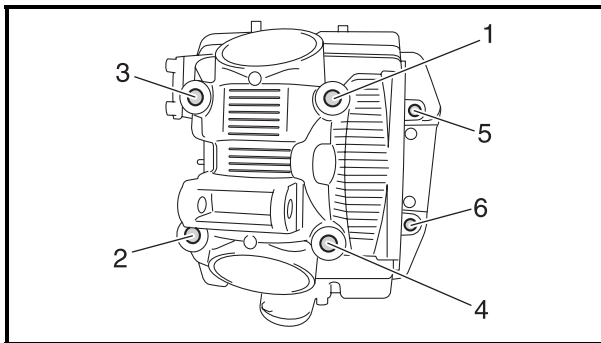
- b. Remove the screwdriver and slowly release the timing chain tensioner rod.
- c. Make sure that the timing chain tensioner rod comes out of the timing chain tensioner housing smoothly. If there is rough movement, replace the timing chain tensioner.



3. Check:
 - Cap bolt
 - Copper washer
 - Spring
 - One-way cam
 - Timing chain tensioner rod
 Damage/wear → Replace the defective part(s).

INSTALLING THE CYLINDER HEAD

1. Install:
 - Cylinder head gasket **New**
 - Dowel pins
2. Install:
 - Cylinder head
 - Copper washers **New**
 - Cylinder head bolts



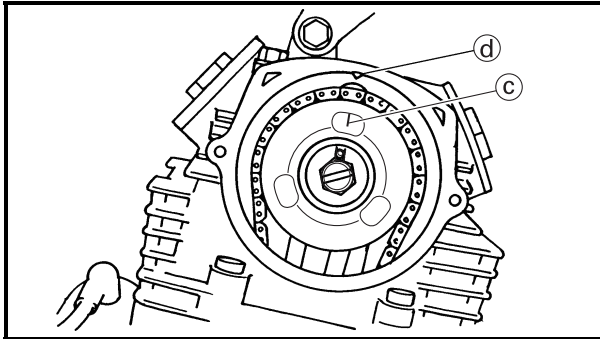
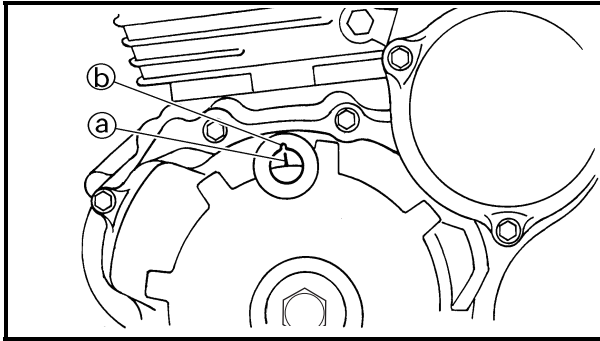
3. Tighten:
 - Cylinder head bolts

	Cylinder head bolt 226 mm (8.90 in)
	24 Nm (2.4 m•kg, 18 ft•lb)
	Cylinder head bolt 45 mm (1.77 in)
	20 Nm (2.0 m•kg, 15 ft•lb)

NOTE: _____

- Apply oil to the bearing surface of (upper) cylinder head bolt. Further, apply molybdenum disulfide grease to thread part.
- Tighten the cylinder head bolts in the proper tightening sequence as shown.

4. Install:
 - Camshaft sprocket
 - Dowel pin
 - Timing chain



6. Turn:
 - Crankshaft
(several turns counterclockwise)
7. Check:
 - "I" mark (a)
Align the "I" mark on the pickup coil rotor with the stationary pointer (b) on the crankcase cover.
 - "I" mark (c)
Align the "I" mark on the camshaft sprocket with the stationary pointer (d) on the cylinder head.
Out of alignment → Correct.
Refer to the installation steps above.
8. Tighten:
 - Camshaft sprocket bolt



Camshaft sprocket bolt
60 Nm (6.0 m•kg, 44 ft•lb)

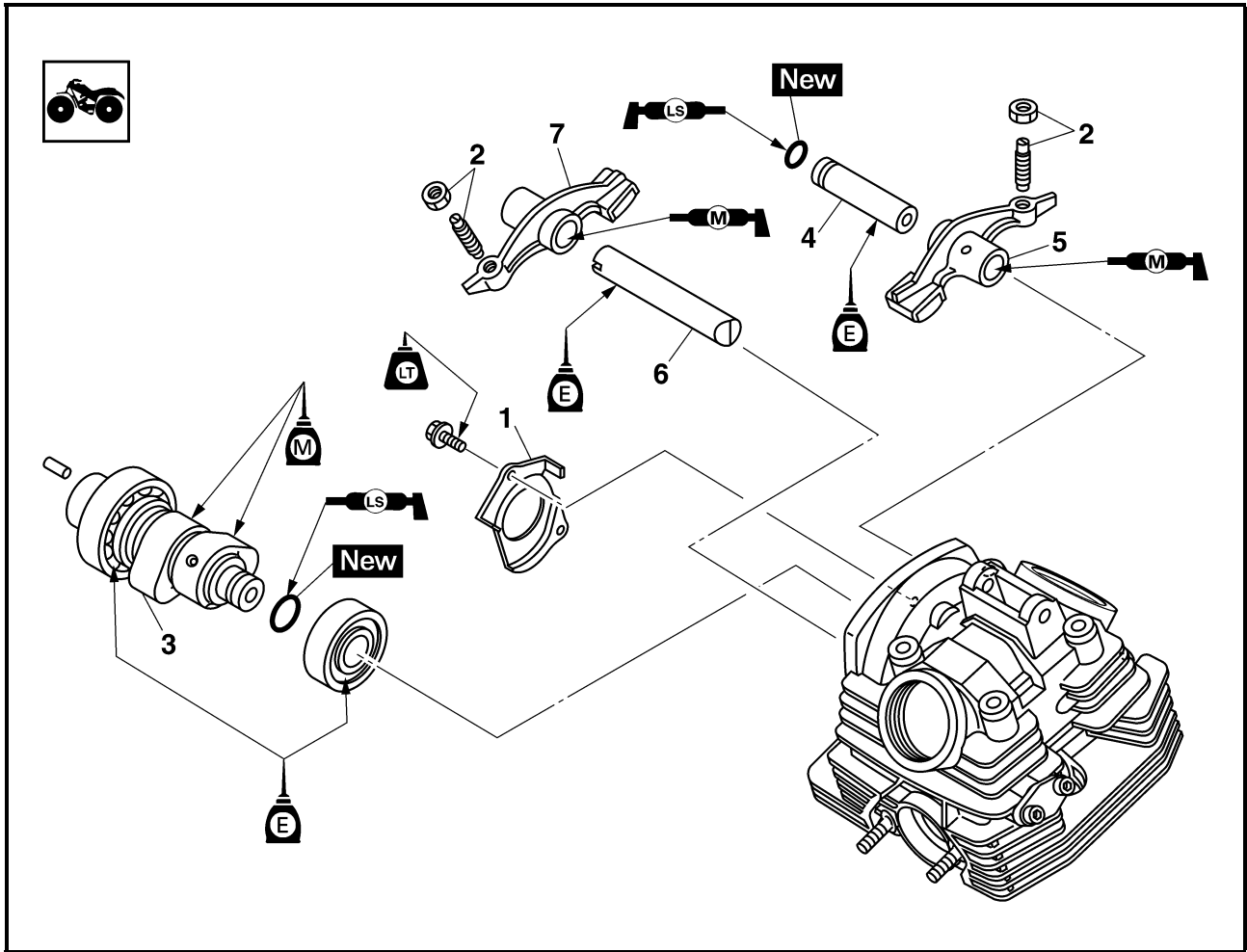
CAUTION:

Be sure to tighten the camshaft sprocket bolts to the specified torque to avoid the possibility of the bolts coming loose and damaging the engine.

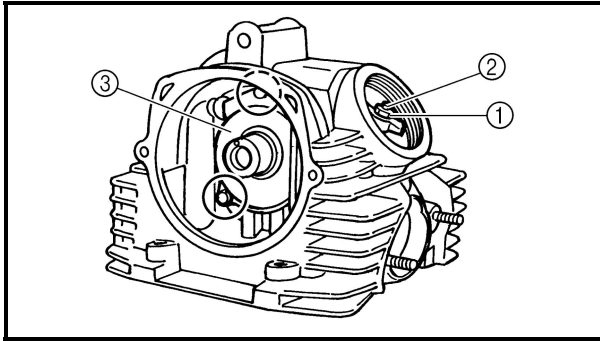
9. Measure:
 - Valve clearance
Out of specification → Adjust.
Refer to "ADJUSTING THE VALVE CLEARANCE" in chapter 3.



ROCKER ARM, CAMSHAFT

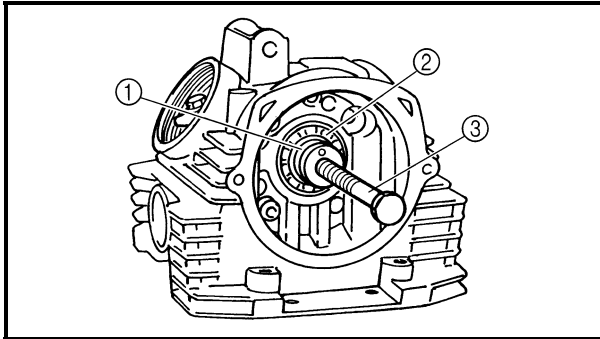


Order	Job/Parts to remove	Q'ty	Remarks
	Removing the rocker arms and camshaft		Remove the parts in the order listed.
	Cylinder head		Refer to "CYLINDER HEAD".
1	Lock plate	1	
2	Locknut/valve clearance adjusting screw	2/2	
3	Camshaft	1	
4	Intake rocker arm shaft	1	
5	Intake rocker arm	1	
6	Exhaust rocker arm shaft	1	
7	Exhaust rocker arm	1	
			For installation, reverse the removal procedure.



REMOVING THE ROCKER ARMS AND CAMSHAFT

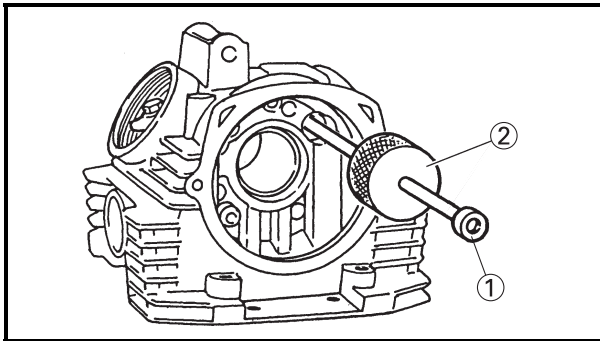
1. Loosen:
 - Locknut ①
 - Valve clearance adjusting screw ②
2. Remove:
 - Stopper plate ③



3. Remove:
 - Camshaft ①
 - Bearing ②

NOTE: _____

Screw 10 mm (0.396 in) bolt ③ into the threaded end of the camshaft and then pull out the camshaft.



4. Remove:
 - Intake rocker arm shaft
 - Exhaust rocker arm shaft
 - Intake rocker arm
 - Exhaust rocker arm

NOTE: _____

Remove the rocker arm shafts with the slide hammer bolt ① and weight ②.

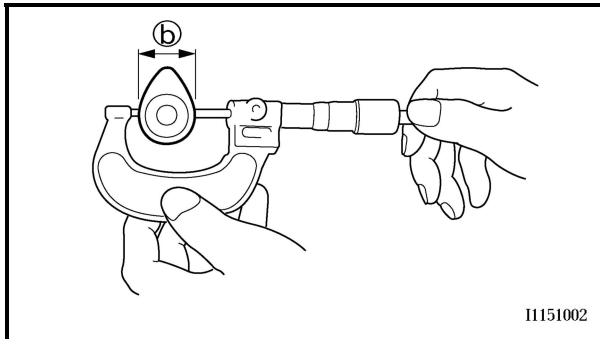
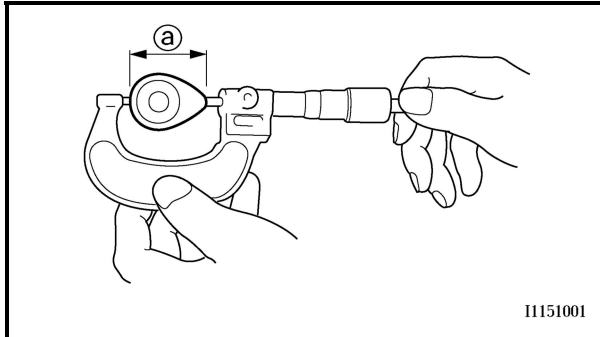


Slide hammer bolt
90890-01083
Slide hammer bolt 6 mm
YU-01083-1
Weight
90890-01084, YU-01083-3



CHECKING THE CAMSHAFT

1. Check:
 - Bearing
Damage/wear → Replace.
2. Check:
 - Camshaft lobes
Blue discoloration/pitting/scratches → Replace the camshaft.



3. Measure:
 - Camshaft lobe dimensions (a) and (b)
Out of specification → Replace the camshaft.



Camshaft lobe dimension

Intake A

36.890 ~ 36.990 mm
(1.4524 ~ 1.4563 in)

Limit

36.790 mm (1.4484 in)

Intake B

30.111 ~ 30.211 mm
(1.1855 ~ 1.1894 in)

Limit

30.011 mm (1.1815 in)

Exhaust A

36.891 ~ 36.991 mm
(1.4524 ~ 1.4563 in)

Limit

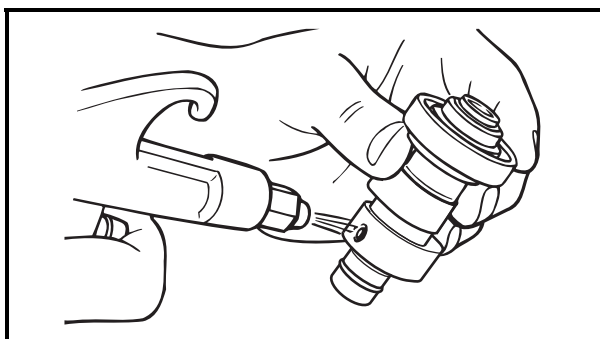
36.791 mm (1.4485 in)

Exhaust B

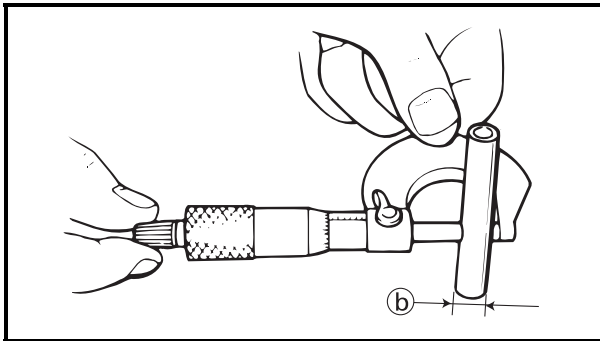
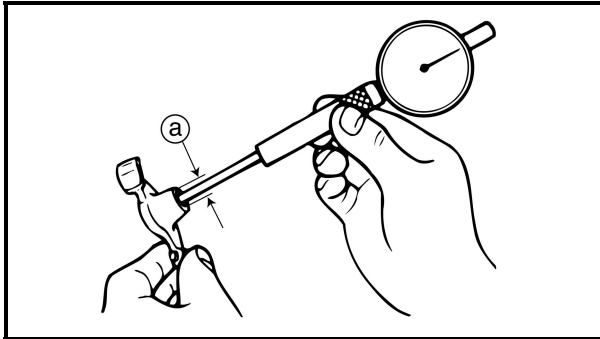
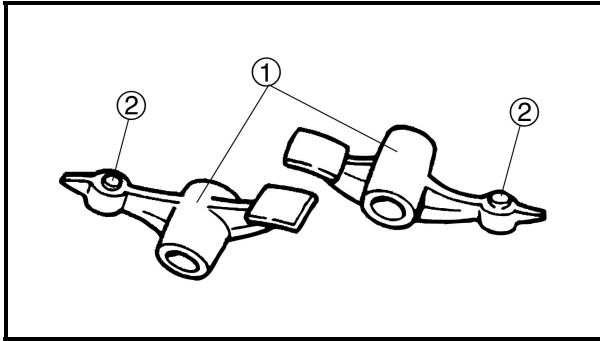
30.092 ~ 30.192 mm
(1.1847 ~ 1.1887 in)

Limit

29.992 mm (1.1808 in)



4. Check:
 - Camshaft oil passage
Obstruction → Blow out with compressed air.



CHECKING THE ROCKER ARMS AND ROCKER ARM SHAFTS

The following procedure applies to all of the rocker arms and rocker arm shafts.

1. Check:
 - Rocker arms ①
 - Valve clearance adjusting screws ②
Damage/wear → Replace.
2. Check:
 - Rocker arm shaft
Blue discoloration/excessive wear/pitting/scratches → Replace or check the lubrication system.
3. Measure:
 - Rocker arm inside diameter ①
Out of specification → Replace.



Rocker arm inside diameter
 12.000 ~ 12.018 mm
 (0.4724 ~ 0.4731 in)
Limit
 12.036 mm (0.4739 in)

4. Measure:
 - Rocker arm shaft outside diameter ②
Out of specification → Replace.



Rocker arm shaft outside diameter
 11.981 ~ 11.991 mm
 (0.4717 ~ 0.4721 in)
Limit
 11.950 mm (0.4705 in)

5. Calculate:
 - Rocker-arm-to-rocker-arm-shaft clearance

NOTE:

Calculate the clearance by subtracting the rocker arm shaft outside diameter from the rocker arm inside diameter.

Out of specification → Replace the defective part(s).




Rocker-arm-to-rocker-arm-shaft clearance
 0.009 ~ 0.037 mm
 (0.0004 ~ 0.0015 in)




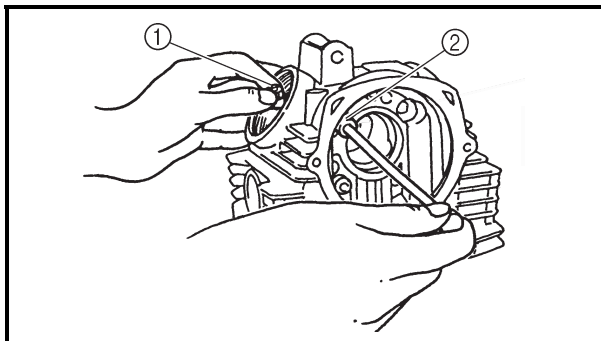
INSTALLING THE CAMSHAFT AND ROCKER ARMS

- Lubricate:
 - Camshaft

	Recommended lubricant
	Camshaft
	Molybdenum disulfide oil
	Camshaft bearing
	Engine oil

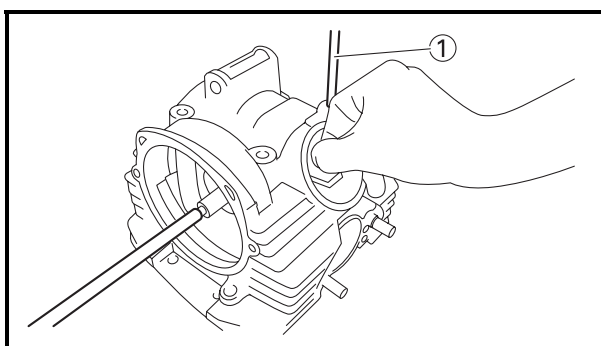
- Lubricate:
 - Rocker arm
 - Rocker arm shaft

	Recommended lubricant
	Rocker arm
	Molybdenum disulfide oil
	Rocker arm shaft
	Engine oil



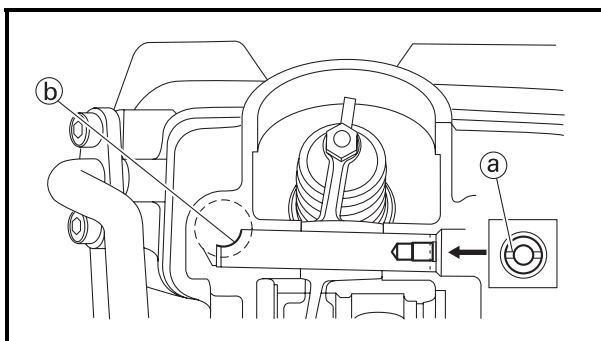
- Install:
 - Exhaust rocker arm ①
 - Exhaust rocker arm shaft ②

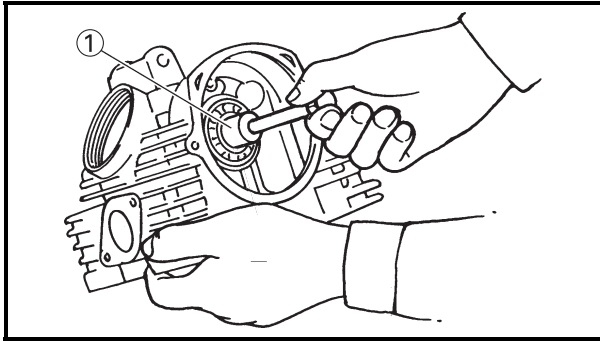
NOTE: _____
 Make sure the exhaust rocker arm shaft is completely pushed into the cylinder head.



- Install:
 - Intake rocker arm
 - Intake rocker arm shaft

NOTE: _____
 • Insert a cylinder head bolt (226 mm) ① into the hole in the cylinder head and the intake rocker arm shaft as shown.
 • Install the intake rocker arm shaft so that groove (a) is horizontal and aligning the notch of the pointed end (b) with the hole in the cylinder head.





5. Install:
- Camshaft ①

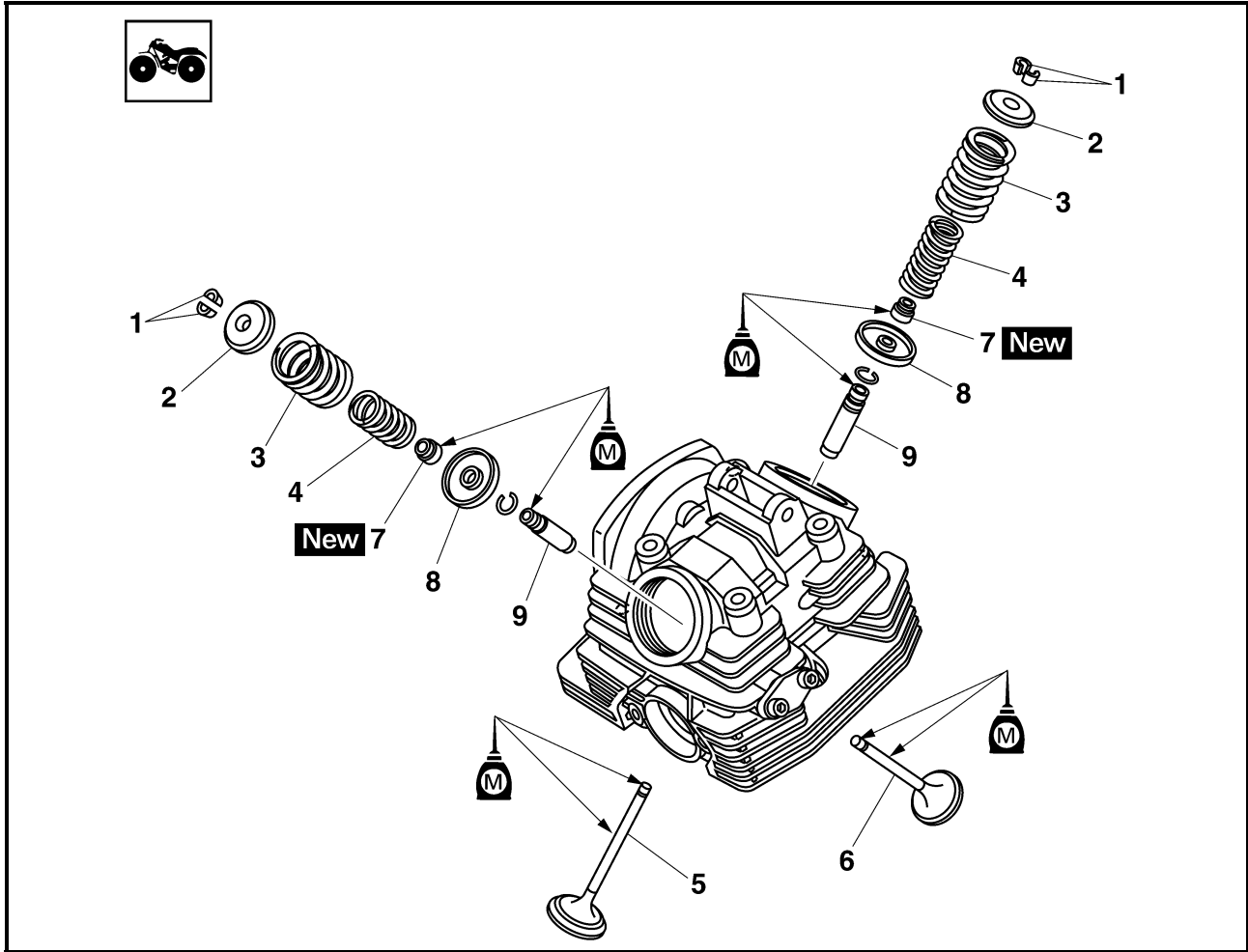
NOTE: _____
Screw a 10 mm bolt into the threaded end of the camshaft and then install the camshaft.

6. Install:
- Lock plate
7. Tighten:
- Lock plate bolts



Lock plate bolt
8 Nm (0.8 m•kg, 5.9 ft•lb)
LOCTITE®

VALVES AND VALVE SPRINGS



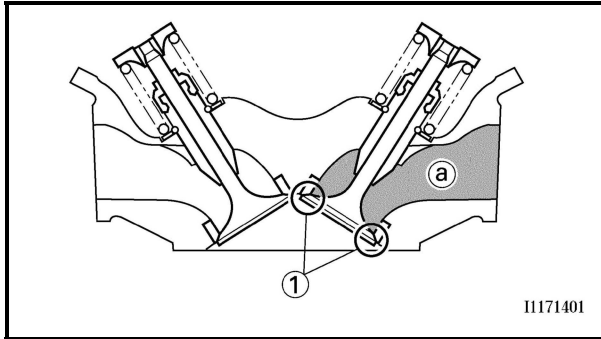
Order	Job/Parts to remove	Q'ty	Remarks
	Removing the valves and valve springs		Remove the parts in the order listed.
	Cylinder head		Refer to "CYLINDER HEAD".
	Rocker arm		Refer to "ROCKER ARM, CAMSHAFT".
	Camshaft		
1	Valve cotter	4	
2	Valve spring retainer	2	
3	Outer valve spring	2	
4	Inner valve spring	2	
5	Intake valve	1	
6	Exhaust valve	1	
7	Valve stem seal	2	
8	Valve spring seat	2	
9	Valve guide	2	
			For installation, reverse the removal procedure.

REMOVING THE VALVES

The following procedure applies to all of the valves and related components.

NOTE: _____

Before removing the internal parts of the cylinder head (e.g., valves, valve springs, valve seats), make sure the valves properly seal.



1. Check:

- Valve sealing

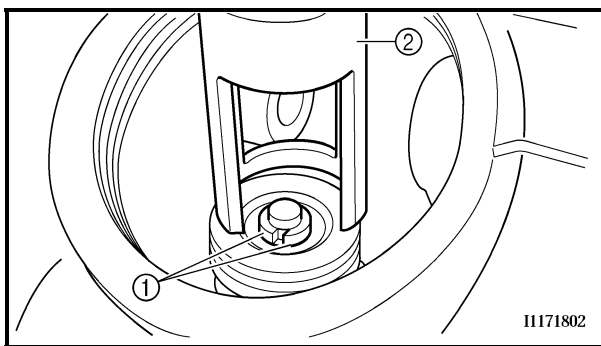
Leakage at the valve seat → Check the valve face, valve seat, and valve seat width. Refer to “CHECKING THE VALVE SEATS”.



- Pour a clean solvent (a) into the intake and exhaust ports.
- Check that the valves properly seal.

NOTE: _____

There should be no leakage at the valve seat (1).



2. Remove:

- Valve cotters (1)

NOTE: _____

Remove the valve cotters by compressing the valve spring with the valve spring compressor and the valve spring compressor attachment (2).



Valve spring compressor

90890-04019

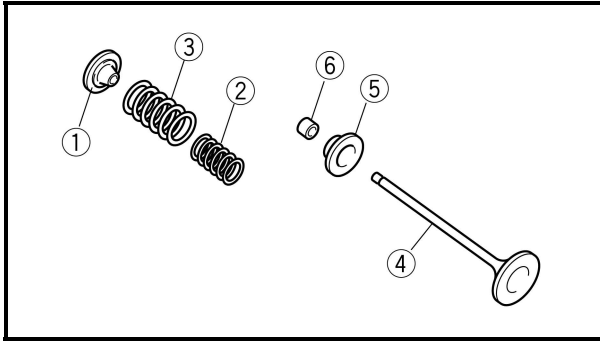
YM-04019

Valve spring compressor attachment

90890-01243

Valve spring compressor adapter (26 mm)

YM-01253-1

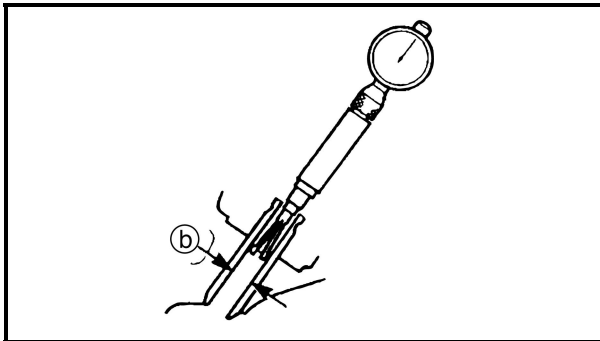
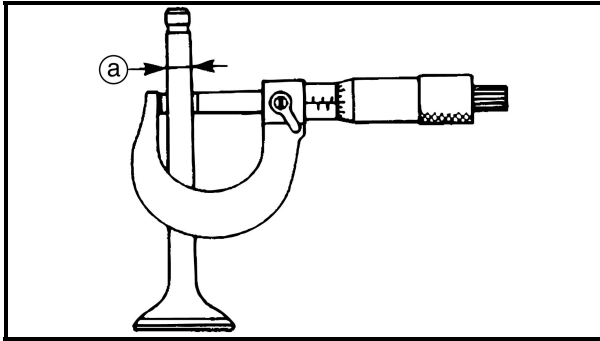


3. Remove:

- Upper spring seat ①
- Inner valve spring ②
- Outer valve spring ③
- Valve ④
- Lower spring seat ⑤
- Valve stem seal ⑥

NOTE:

Identify the position of each part very carefully so that it can be reinstalled in its original place.



CHECKING THE VALVES AND VALVE GUIDES

The following procedure applies to all of the valves and valve guides.

1. Measure:

- Valve-stem-to-valve-guide clearance
Out of specification → Replace the valve guide.

$$\text{Valve-stem-to-valve-guide clearance} = \text{Valve guide inside diameter (a)} - \text{Valve stem diameter (b)}$$



Valve-stem-to-valve-guide clearance

Valve-stem-to-valve-guide clearance (intake)

0.010 ~ 0.037 mm
(0.0004 ~ 0.0015 in)

Limit

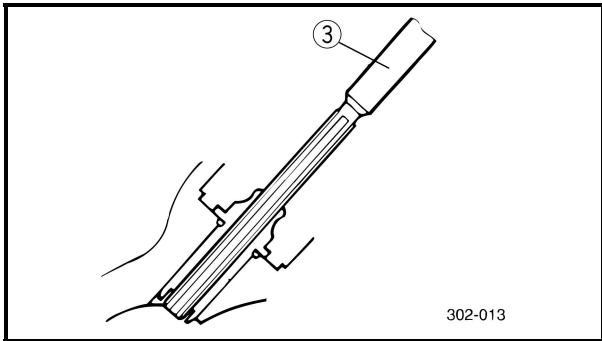
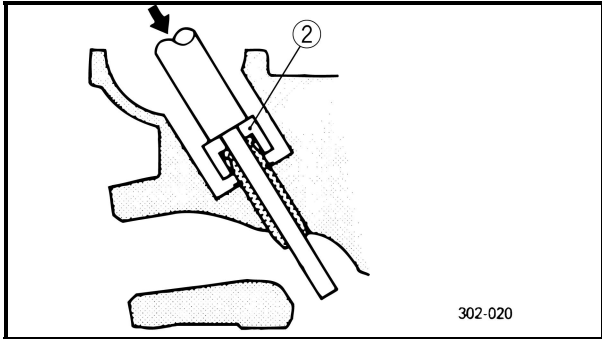
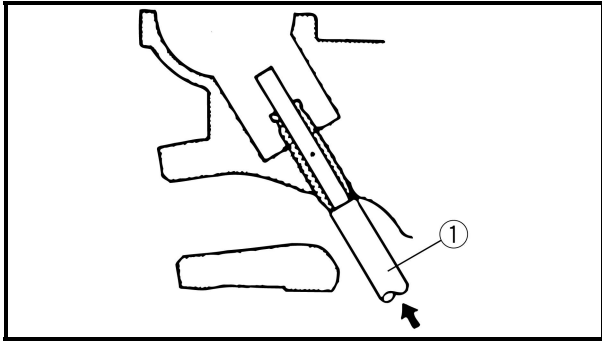
0.080 mm (0.003 in)

Valve-stem-to-valve-guide clearance (exhaust)

0.025 ~ 0.052 mm
(0.0010 ~ 0.0020 in)

Limit

0.100 mm (0.004 in)



2. Replace:
- Valve guide

NOTE: _____

To ease valve guide removal and installation, and to maintain the correct fit, heat the cylinder head to 100°C (212°F) in an oven.



- Remove the valve guide with the valve guide remover (1).
- Install the new valve guide with the valve guide installer (2) and valve guide remover (1).
- After installing the valve guide, bore the valve guide with the valve guide reamer (3) to obtain the proper valve-stem-to-valve-guide clearance.

NOTE: _____

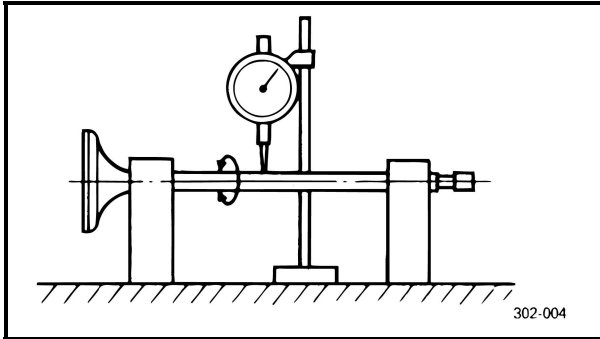
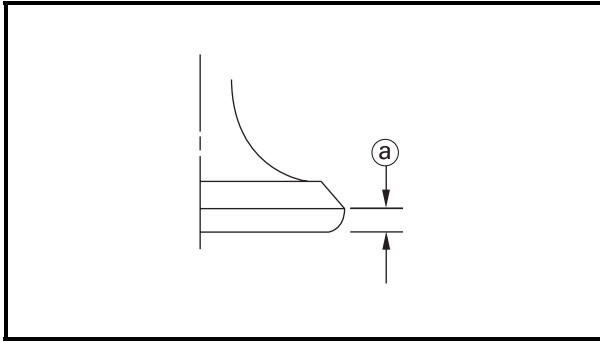
After replacing the valve guide, reface the valve seat.



- Valve guide remover (ø6)
90890-04064
- Valve guide remover (6.0 mm)
YM-04064-A
- Valve guide installer (ø6)
90890-04065
- Valve guide installer (6.0 mm)
YM-04065-A
- Valve guide reamer (ø6)
90890-04066
- Valve guide reamer (6.0 mm)
YM-04066



- Eliminate:
 - Carbon deposits (from the valve face and valve seat)
- Check:
 - Valve face
Pitting/wear → Grind the valve face.
 - Valve stem end
Mushroom shape or diameter larger than the body of the valve stem → Replace the valve.



5. Measure:

- Valve margin thickness D (a)
Out of specification → Replace the valve.



Valve margin thickness
Valve margin thickness D (intake)
 0.80 ~ 1.20 mm
 (0.0315 ~ 0.0472 in)
Valve margin thickness D (exhaust)
 0.80 ~ 1.20 mm
 (0.0315 ~ 0.0472 in)

6. Measure:

- Valve stem runout
Out of specification → Replace the valve.

NOTE:

- When installing a new valve, always replace the valve guide.
- If the valve is removed or replaced, always replace the oil seal.

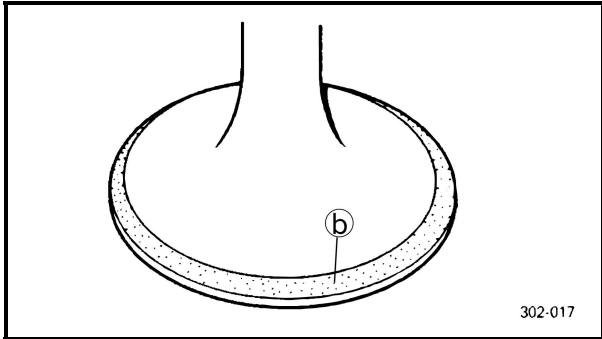
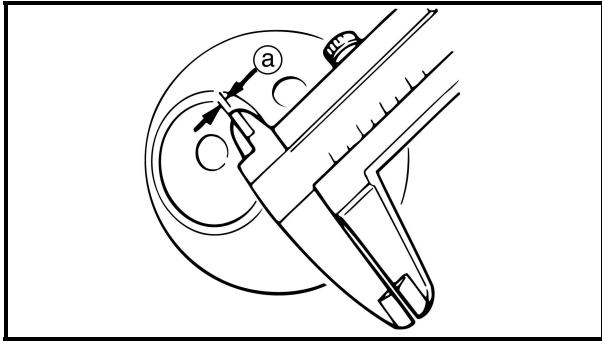


Valve stem runout
 0.01 mm (0.0004 in)

CHECKING THE VALVE SEATS

The following procedure applies to all of the valves and valve seats.


1. Eliminate:
 - Carbon deposits
(from the valve face and valve seat)
2. Check:
 - Valve seat
Pitting/wear → Replace the cylinder head.



302-017

3. Measure:

- Valve seat width (a)
Out of specification → Replace the cylinder head.

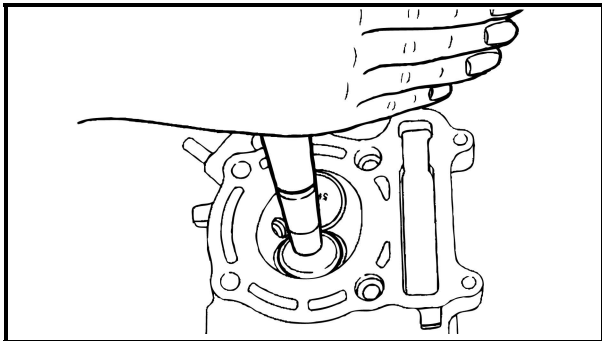
	Valve seat width
	Valve seat width C (intake)
	0.90 ~ 1.10 mm (0.0354 ~ 0.0433 in)
	Valve seat width C (exhaust)
	0.90 ~ 1.10 mm (0.0354 ~ 0.0433 in)



- Apply Mechanic's blueing dye (Dykem) (b) onto the valve face.
- Install the valve into the cylinder head.
- Press the valve through the valve guide and onto the valve seat to make a clear impression.
- Measure the valve seat width.

NOTE: _____


Where the valve seat and valve face contacted one another, the blueing will have been removed.

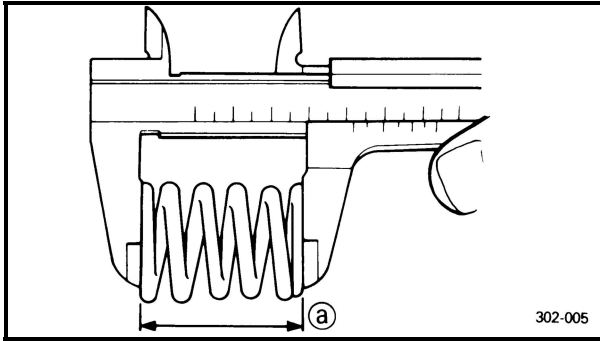


- Lap:
 - Valve face
 - Valve seat

NOTE: _____

After replacing the cylinder head or replacing the valve and valve guide, the valve seat and valve face should be lapped.

	Valve lapper
	90890-04101
	Valve lapping tool
	YM-A8998



CHECKING THE VALVE SPRINGS

The following procedure applies to all of the valve springs.

1. Measure:
 - Valve spring free length (a)
Out of specification → Replace the valve spring.



Inner spring

Free length (intake)

36.17 mm (1.42 in)

Free length (exhaust)

36.17 mm (1.42 in)

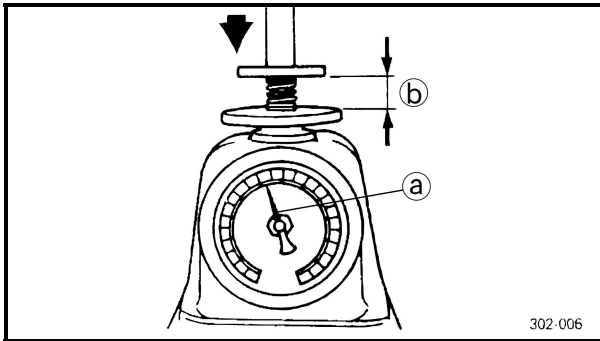
Outer spring

Free length (intake)

36.63 mm (1.44 in)

Free length (exhaust)

36.63 mm (1.44 in)



2. Measure:

- Compressed valve spring force (a)
Out of specification → Replace the valve spring.

(a) Compressed valve spring force

(b) Installed length



Inner spring

Installed compression spring force (intake)

75.00 ~ 91.70 N (7.65 ~

9.35 kg) (16.86 ~ 20.62 lb)

Installed compression spring force (exhaust)

75.00 ~ 91.70 N (7.65 ~

9.35 kg) (16.86 ~ 20.62 lb)

Installed length (intake)

30.50 mm (1.20 in)

Installed length (exhaust)

30.50 mm (1.20 in)

Outer spring

Installed compression spring force (intake)

128.50 ~ 157.90 N (13.10 ~

16.10 kg) (28.89 ~ 35.50 lb)

Installed compression spring force (exhaust)

128.50 ~ 157.90 N (13.10 ~

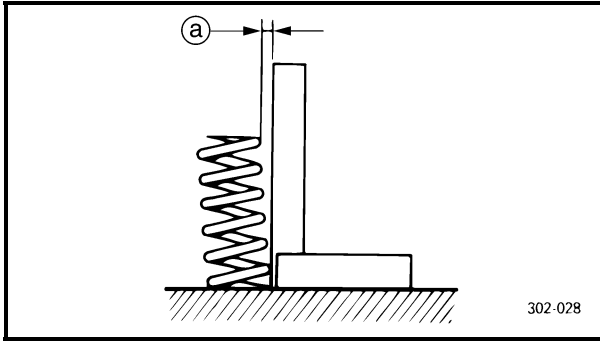
16.10 kg) (28.89 ~ 35.50 lb)

Installed length (intake)

32.00 mm (1.26 in)

Installed length (exhaust)

32.00 mm (1.26 in)



3. Measure:

- Valve spring tilt (a)
Out of specification → Replace the valve spring.



Inner spring

Spring tilt (intake)

2.5°/1.60 mm (2.5°/0.063 in)

Spring tilt (exhaust)

2.5°/1.60 mm (2.5°/0.063 in)

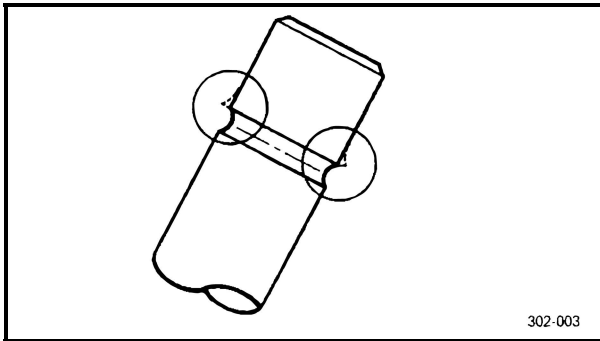
Outer spring

Spring tilt (intake)

2.5°/1.60 mm (2.5°/0.063 in)

Spring tilt (exhaust)

2.5°/1.60 mm (2.5°/0.063 in)



INSTALLING THE VALVES

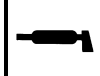
The following procedure applies to all of the valves and related components.

1. Deburr:

- Valve stem end
(with an oil stone)

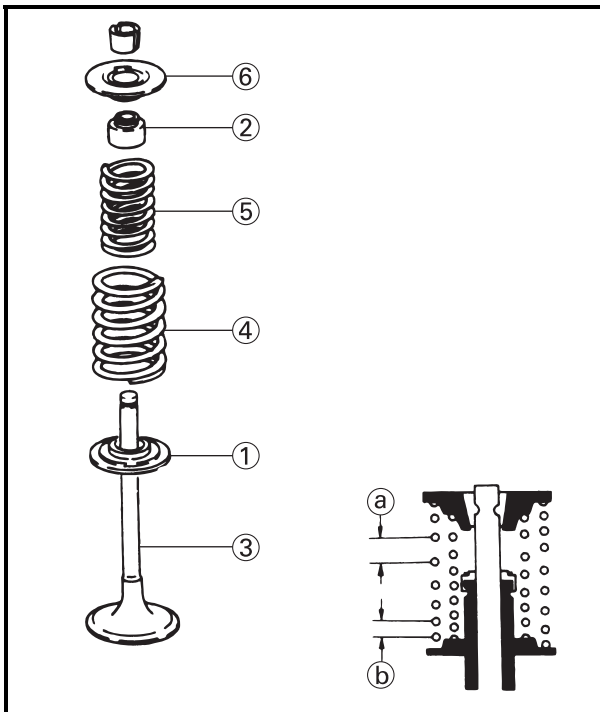
2. Lubricate:

- Valve stem
- Valve stem seal
(with the recommended lubricant)



Recommended lubricant

Molybdenum disulfide oil



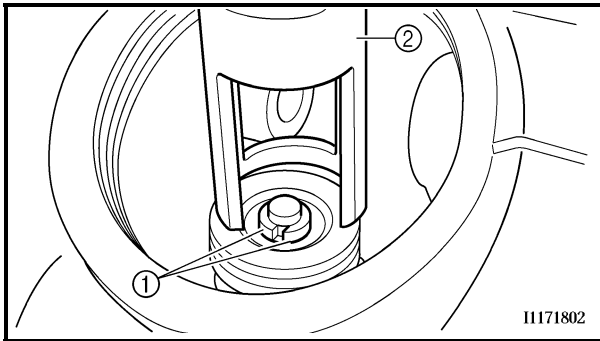
3. Install:

- Valve spring seat (1)
- Valve stem seal (2) **New**
- Valve (3)
- Inner valve spring (4)
- Outer valve spring (5)
- Upper spring seat (6)
(into the cylinder head)

NOTE:

Install the valve springs with the larger pitch (a) facing up.

- (a) Larger pitch
- (b) Smaller pitch

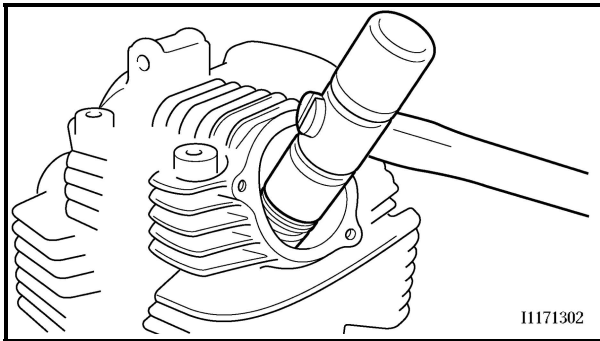


4. Install:
- Valve cotteners ①

NOTE: _____
 Install the valve cotteners by compressing the valve spring with the valve spring compressor and the valve spring compressor attachment ②.



Valve spring compressor
 90890-04019, YM-04019
Valve spring compressor attachment
 90890-01243
Valve spring compressor adapter (26 mm)
 YM-01253-1

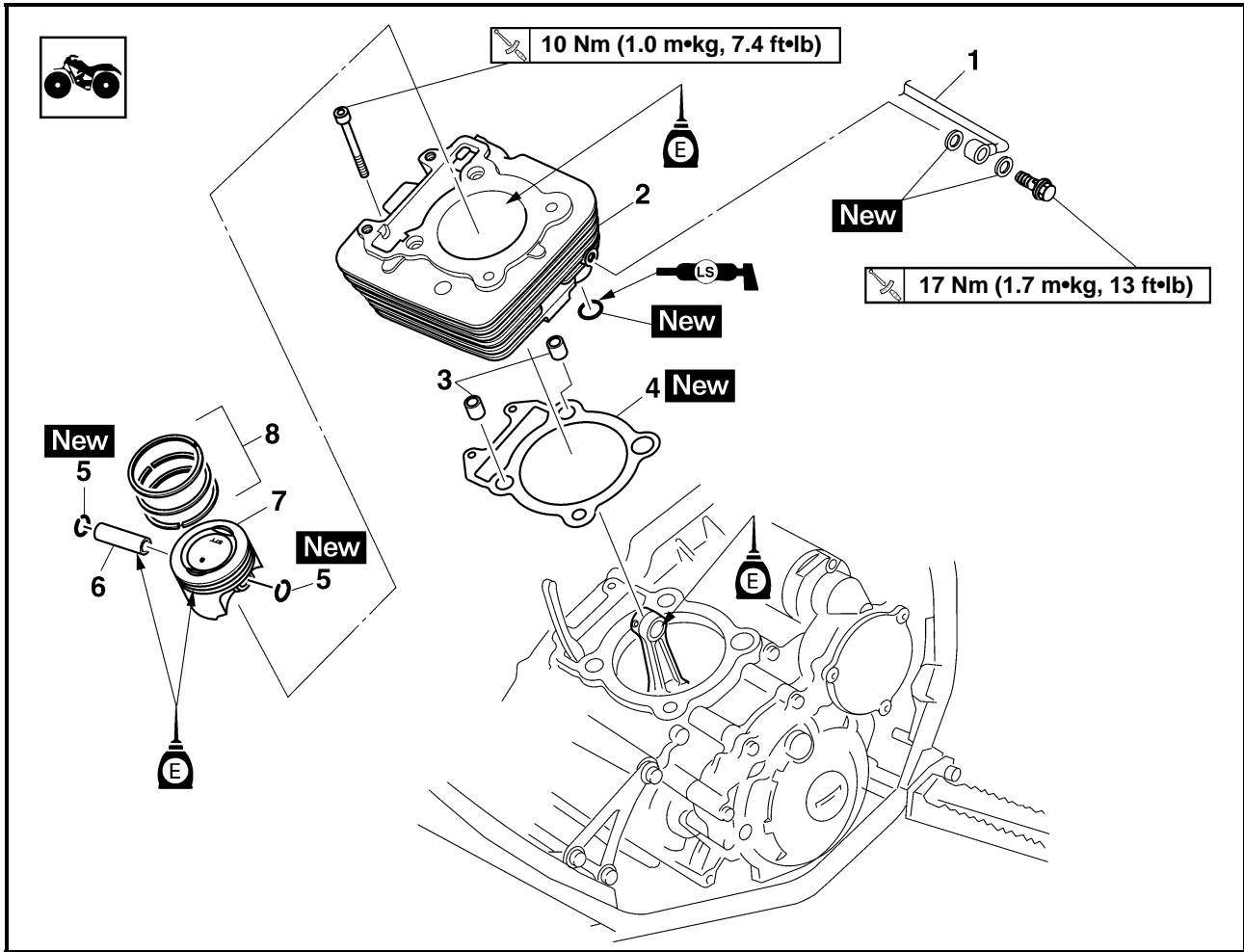


5. To secure the valve cotteners onto the valve stem, lightly tap the valve tip with a soft-face hammer.

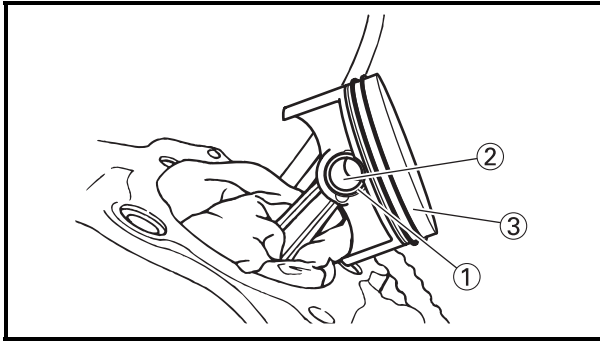
CAUTION: _____
Hitting the valve tip with excessive force could damage the valve.



CYLINDER AND PISTON



Order	Job/Parts to remove	Q'ty	Remarks
	Removing the cylinder and piston		Remove the parts in the order listed. Refer to "CYLINDER HEAD".
1	Oil delivery pipe	1	
2	Cylinder	1	
3	Dowel pin	2	
4	Cylinder gasket	1	
5	Piston pin clip	2	
6	Piston pin	1	
7	Piston	1	
8	Piston ring set	1	
			For installation, reverse the removal procedure.

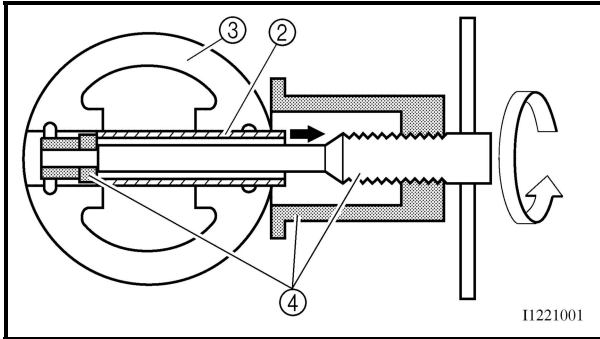


REMOVING THE PISTON

1. Remove:
 - Piston pin clips ①
 - Piston pin ②
 - Piston ③

NOTE: _____

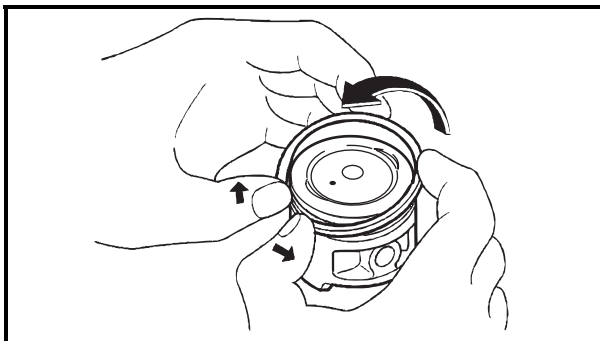
- Before removing the piston pin clip, cover the crankcase opening with a clean rag to prevent the piston pin clip from falling into the crankcase.
- Before removing each piston pin, deburr the clip groove and pin hole area. If the piston pin groove is deburred and the piston pin is still difficult to remove, use the piston pin puller ④.



Piston pin puller set
90890-01304
Piston pin puller
YU-01304

CAUTION: _____

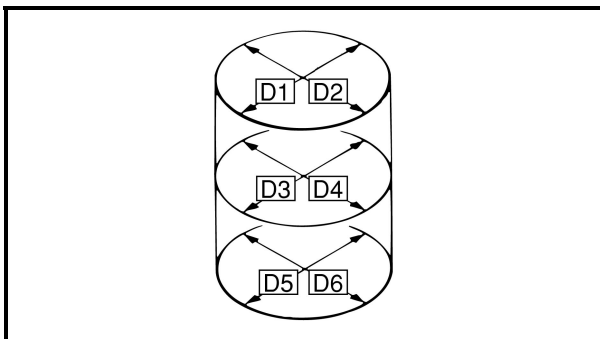
Do not use a hammer to drive the piston pin out.



2. Remove:
 - Top ring
 - 2nd ring
 - Oil ring

NOTE: _____

When removing a piston ring, open the end gap with your fingers and lift the other side of the ring over the piston crown.



CHECKING THE CYLINDER AND PISTON

1. Check:
 - Piston wall
 - Cylinder wall

Vertical scratches → Rebore or replace the cylinder, and replace the piston and piston rings as a set.
2. Measure:
 - Piston-to-cylinder clearance



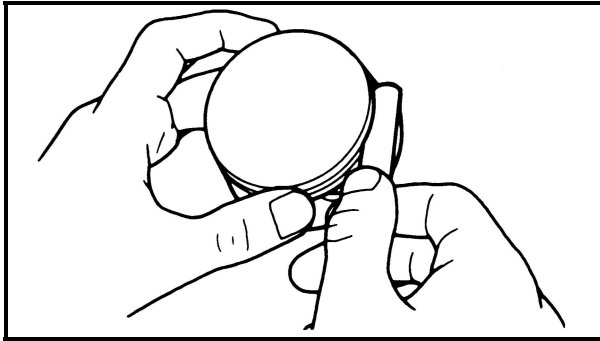
Piston-to-cylinder clearance

**0.010 ~ 0.025 mm
(0.0004 ~ 0.0010 in)**

Limit

0.15 mm (0.006 in)

- f. If out of specification, rebore or replace the cylinder, and replace the piston and piston rings as a set.



CHECKING THE PISTON RINGS

1. Measure:

- Piston ring side clearance

Out of specification → Replace the piston and piston rings as a set.

NOTE:

Before measuring the piston ring side clearance, eliminate any carbon deposits from the piston ring grooves and piston rings.



Piston ring

Top ring

Ring side clearance

**0.030 ~ 0.065 mm
(0.0012 ~ 0.0026 in)**

Limit

0.115 mm (0.0045 in)

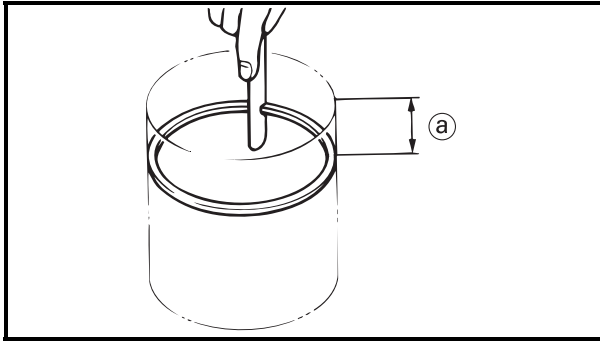
2nd ring

Ring side clearance

**0.020 ~ 0.055 mm
(0.0008 ~ 0.0022 in)**

Limit

0.115 mm (0.0045 in)



2. Install:
 - Piston ring
(into the cylinder)

NOTE: _____
Level the piston ring into the cylinder with the piston crown.

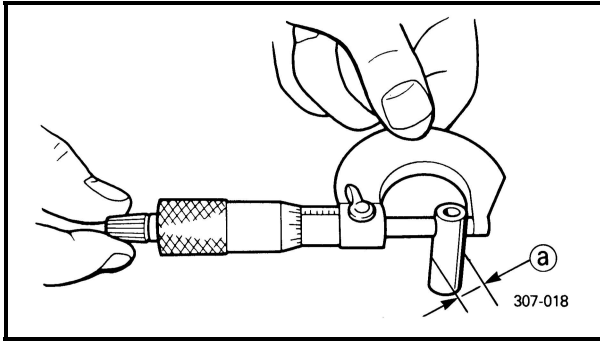
Ⓐ 40 mm (1.476 in)

3. Measure:
 - Piston ring end gap
Out of specification → Replace the piston ring.

NOTE: _____
The oil ring expander spacer's end gap cannot be measured. If the oil ring rail's gap is excessive, replace all three piston rings.



Piston ring
Top ring
End gap (installed)
0.19 ~ 0.31 mm
(0.007 ~ 0.012 in)
Limit
0.56 mm (0.022 in)
2nd ring
End gap (installed)
0.30 ~ 0.45 mm
(0.012 ~ 0.018 in)
Limit
0.80 mm (0.032 in)
Oil ring
End gap (installed)
0.10 ~ 0.35 mm
(0.004 ~ 0.014 in)

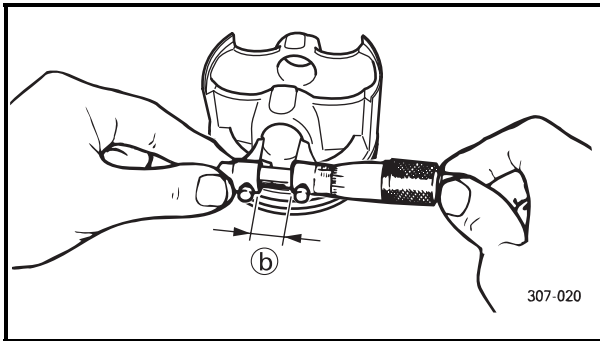


CHECKING THE PISTON PIN

1. Check:
 - Piston pin
Blue discoloration/grooves → Replace the piston pin and then check the lubrication system.
2. Measure:
 - Piston pin outside diameter (a)
Out of specification → Replace the piston pin.



Piston pin outside diameter
 16.991 ~ 17.000 mm
 (0.6689 ~ 0.6693 in)
Limit
 16.971 mm (0.6681 in)



3. Measure:
 - Piston pin bore diameter (b)
Out of specification → Replace the piston.



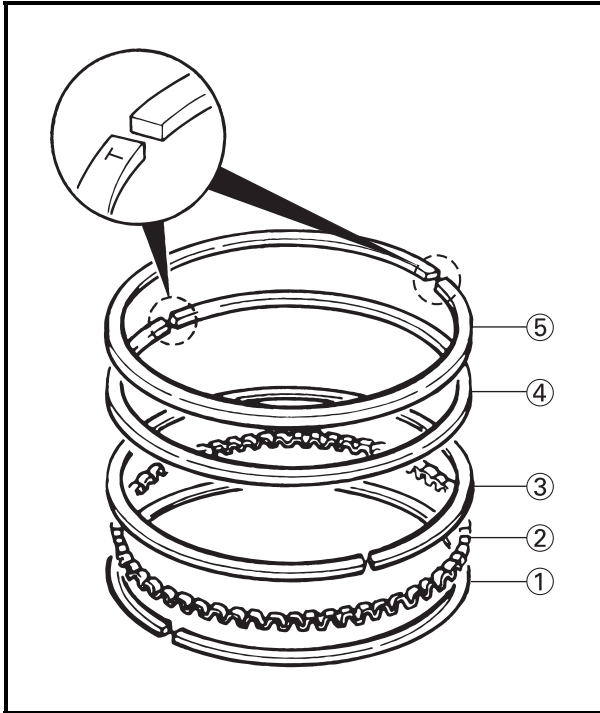
Piston pin bore inside diameter
 17.002 ~ 17.013 mm
 (0.6694 ~ 0.6698 in)
Limit
 17.043 mm (0.6710 in)

4. Calculate:
 - Piston-pin-to-piston-pin-bore clearance
Out of specification → Replace the piston pin and piston as a set.

Piston-pin-to-piston-pin-bore clearance =
 Piston pin bore diameter (b) -
 Piston pin outside diameter (a)



Piston-pin-to-piston-pin-bore clearance
 0.002 ~ 0.022 mm
 (0.0001 ~ 0.0009 in)
Limit
 0.072 mm (0.0028 in)

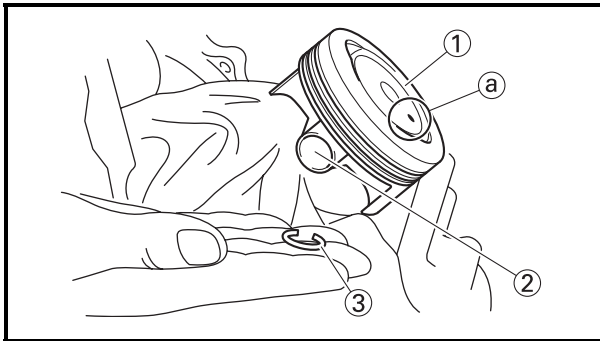


INSTALLING THE PISTON AND CYLINDER

1. Install:
 - Lower oil ring rail ①
 - Oil ring expander ②
 - Upper oil ring rail ③
 - 2nd ring ④
 - Top ring ⑤

NOTE: _____

Be sure to install the piston rings so that the "T" marks or numbers face up.



2. Install:
 - Piston ①
 - Piston pin ②
 - Piston pin clips ③ **New**

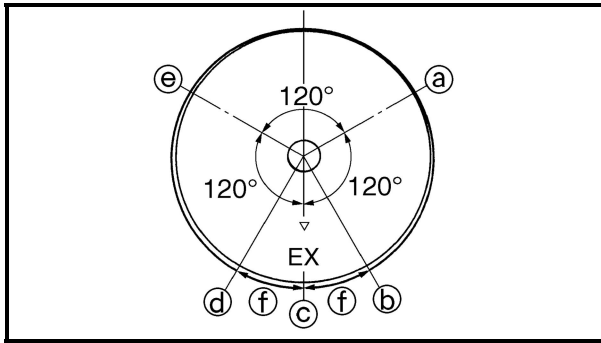
NOTE: _____

- Apply engine oil the piston pin.
- Make sure the dot (a) on the piston points towards the exhaust side of the cylinder.
- Before installing the piston pin clip, cover the crankcase opening with a clean rag to prevent the clip from falling into the crankcase.

3. Install:
 - O-ring **New**
 - Cylinder gasket **New**
 - Dowel pins

4. Lubricate:
 - Piston
 - Piston rings
 - Cylinder
(with the recommended lubricant)

	Recommended lubricant Engine oil
--	---



5. Offset:
- Piston ring end gaps

- (a) Top ring
- (b) Upper oil ring rail
- (c) Oil ring expander
- (d) Lower oil ring rail
- (e) 2nd ring
- (f) 20 mm

6. Install:
- Cylinder

NOTE: _____

- While compressing the piston rings with one hand, install the cylinder with the other hand.
- Pass the timing chain and timing chain guide (exhaust side) through the timing chain cavity.

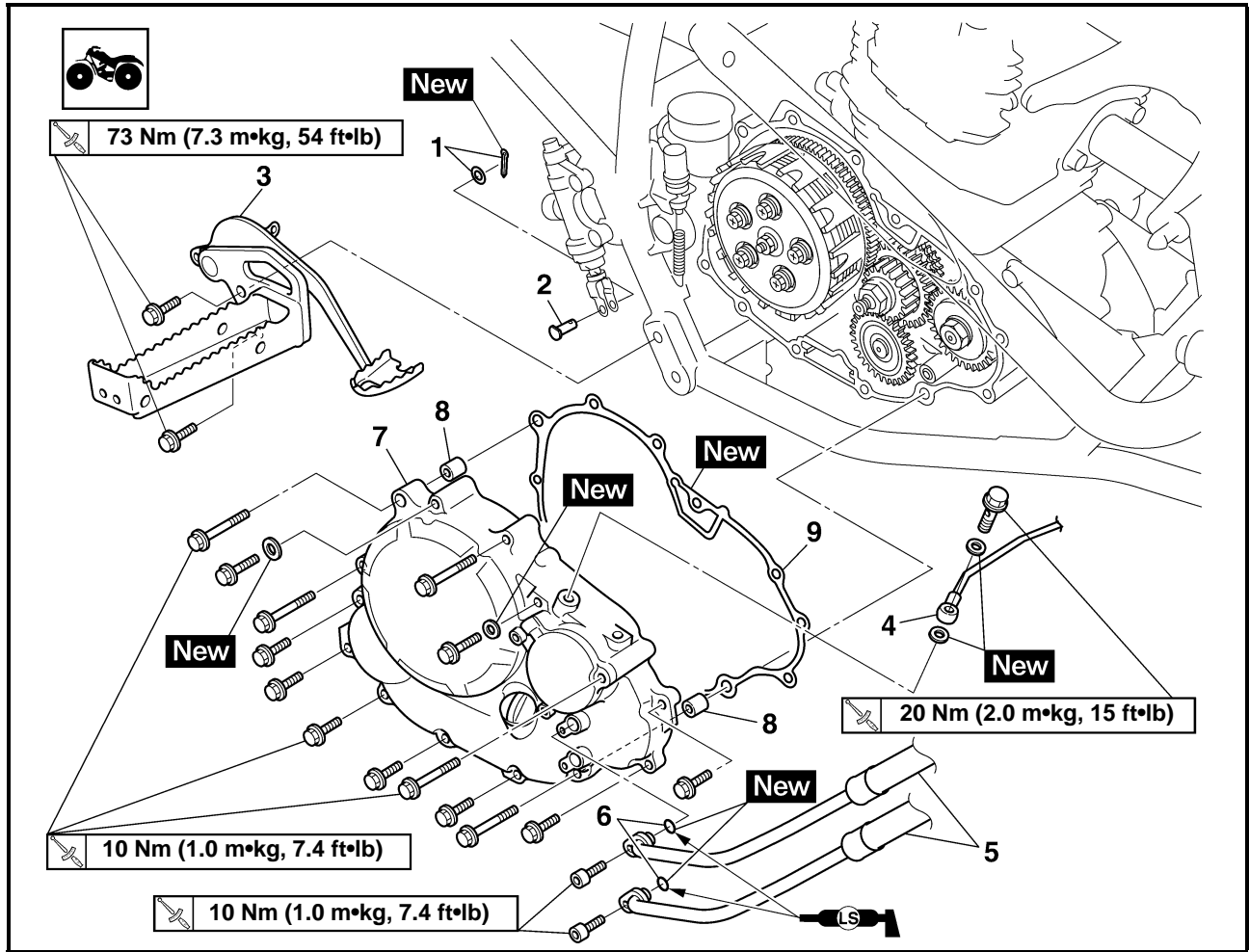
7. Tighten:
- Cylinder bolts



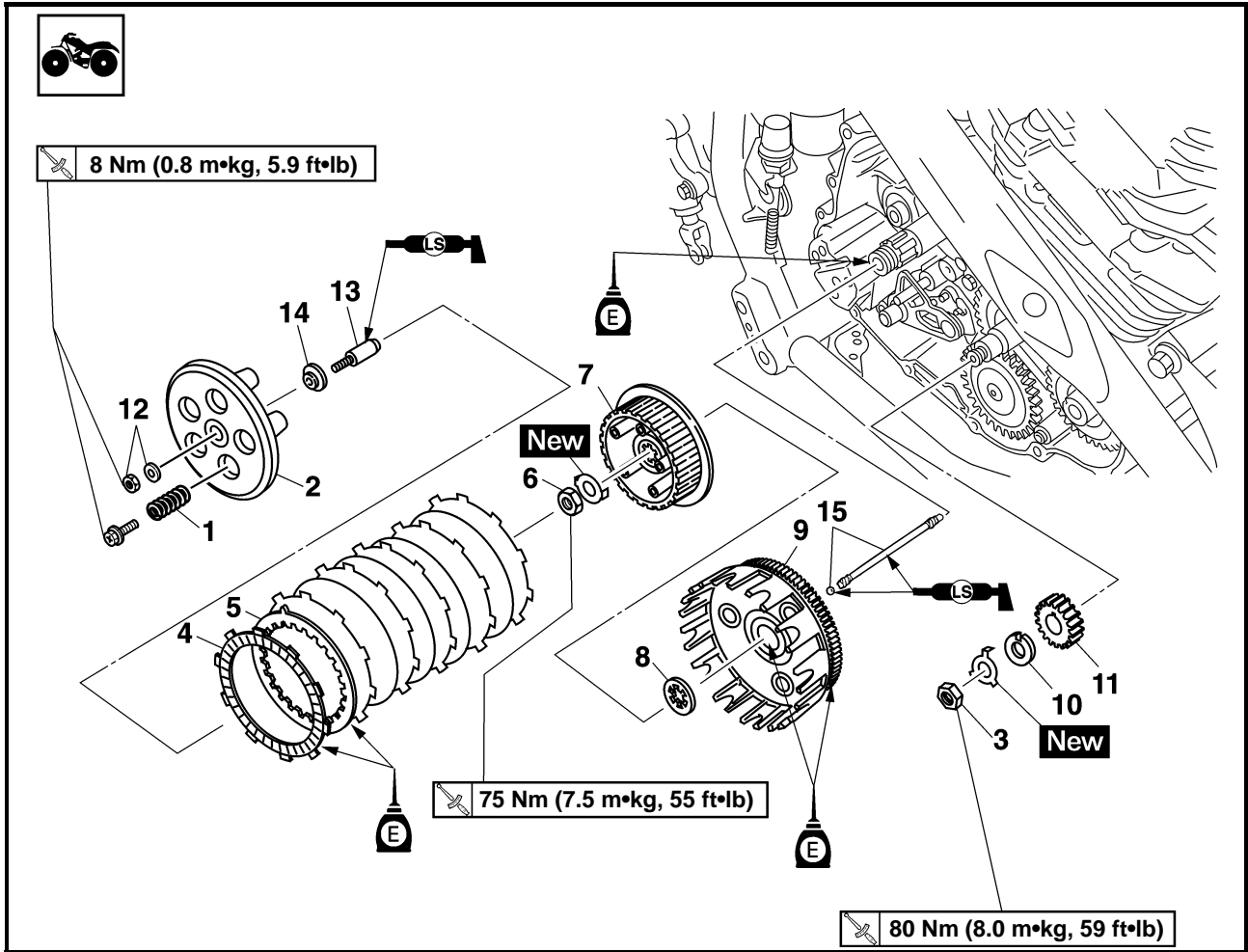
Cylinder bolt
10 Nm (1.0 m•kg, 7.4 ft•lb)



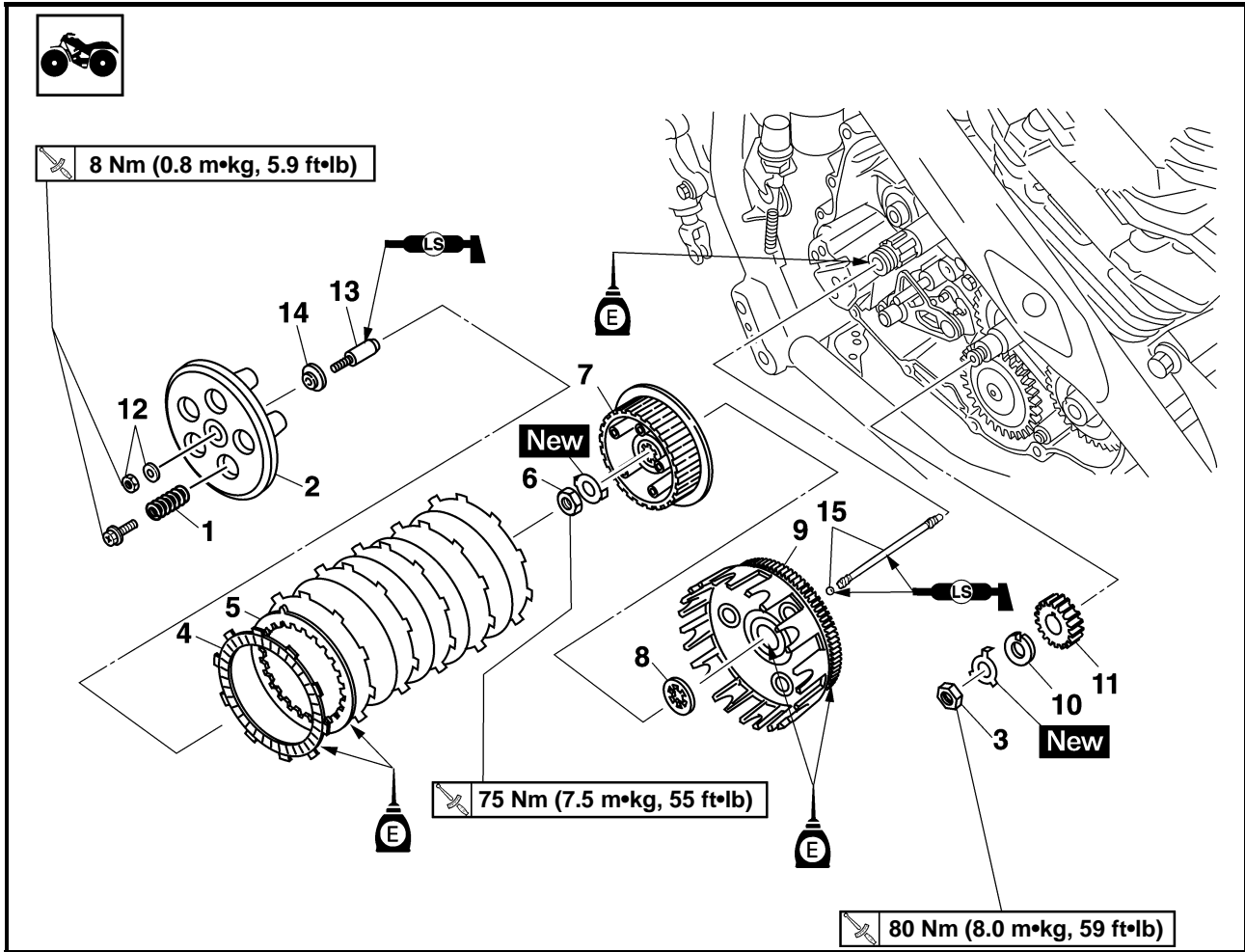
CLUTCH



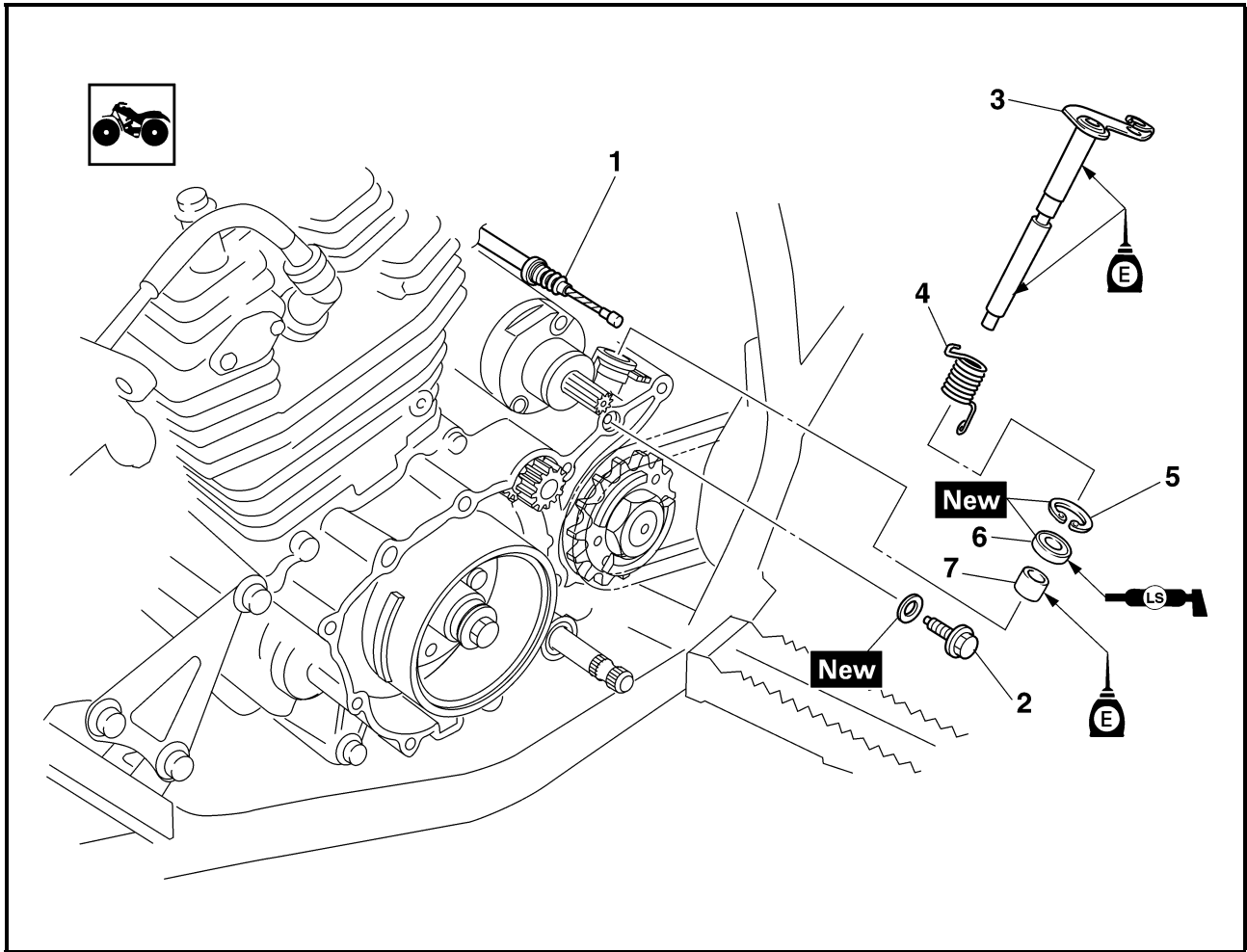
Order	Job/Parts to remove	Q'ty	Remarks
	Removing the clutch cover		Remove the parts in the order listed.
	Engine oil		Drain.
1	Cotter pin/Washer	1/1	
2	Clevis pin	1	
3	Brake pedal/Footrest	1/1	
4	Oil delivery pipe	1	
5	Oil cooler hose	2	
6	O-ring	2	
7	Right crankcase cover	1	
8	Dowel pin	2	
9	Crankcase cover gasket	1	
			For installation, reverse the removal procedure.



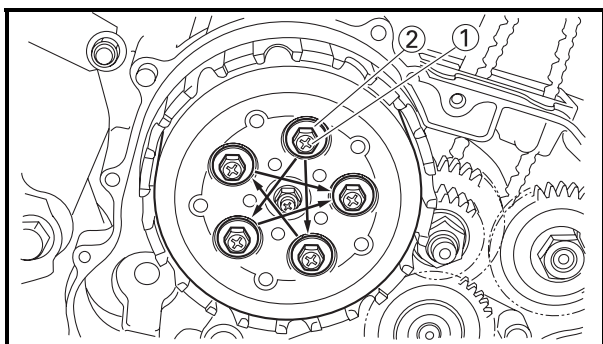
Order	Job/Parts to remove	Q'ty	Remarks
	Removing the clutch		Remove the parts in the order listed.
1	Clutch spring	5	
2	Pressure plate	1	
3	Primary drive gear nut	1	
4	Friction plate	6	
5	Clutch plate	5	
6	Clutch boss nut	1	
7	Clutch boss	1	
8	Thrust washer	1	
9	Clutch housing	1	
10	Claw washer	1	
11	Primary drive gear	1	
12	Locknut/Washer	1/1	
13	Push rod1	1	
14	Push plate	1	



Order	Job/Parts to remove	Q'ty	Remarks
15	Push rod 2/Ball	1/1	For installation, reverse the removal procedure.



Order	Job/Parts to remove	Q'ty	Remarks
	Removing the push lever shaft		Remove the parts in the order listed.
	Shift pedal		Refer to "SHIFT SHAFT".
	Left crankcase cover		Refer to "PICK UP COIL ROTOR AND STARTER CLUTCH".
	Clutch assembly		
1	Clutch cable	1	
2	Bolt	1	
3	Push lever shaft	1	
4	Torsion spring	1	
5	Circlip	1	
6	Oil seal	1	
7	Bearing	1	
			For installation, reverse the removal procedure.



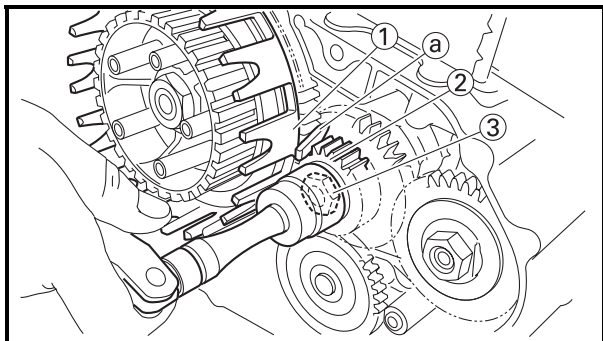
REMOVING THE CLUTCH

1. Remove:
 - Bolt ①
 - Clutch spring ②

NOTE: _____

Loosen the bolts in stages and in a crisscross pattern.

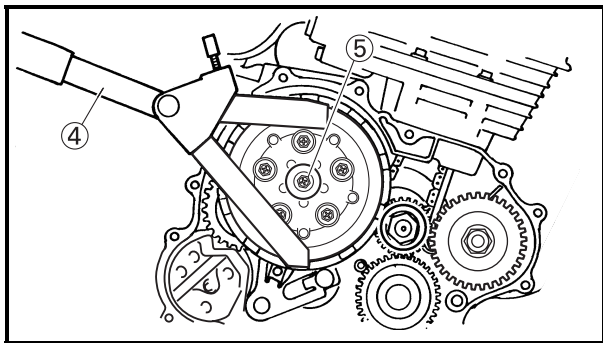
2. Straighten the lock washer tab.



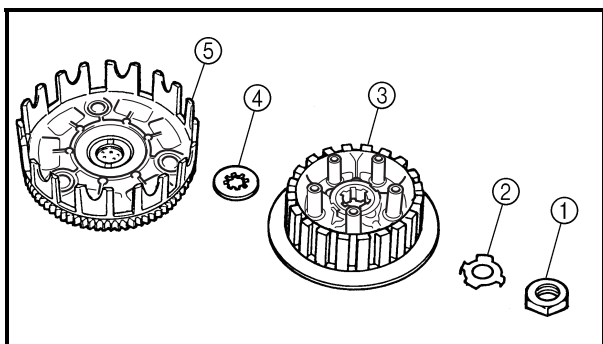
3. Loosen:
 - Primary drive gear nut
 - Clutch boss nut

NOTE: _____

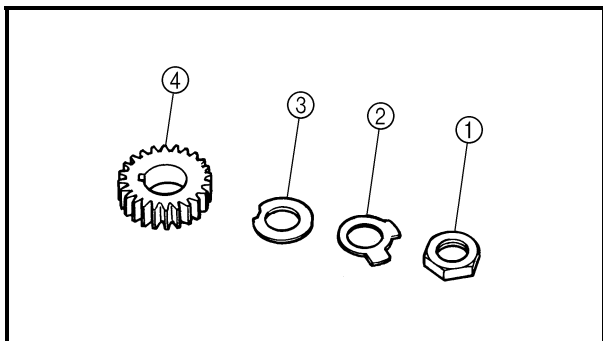
- Place the aluminum plate (a) between clutch housing ① and primary drive gear ②, and then loosen the primary drive gear nut ③.
- While holding the clutch boss with the universal clutch holder ④, loosen the clutch boss nut ⑤.



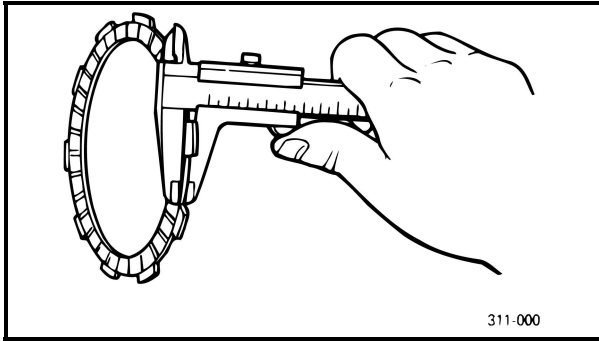
Universal clutch holder
90890-04086, YM-91042



4. Remove:
 - Clutch boss nut ①
 - Lock washer ②
 - Clutch boss ③
 - Thrust washer ④
 - Clutch housing ⑤



5. Remove:
 - Primary drive gear nut ①
 - Lock washer ②
 - Claw washer ③
 - Primary drive gear ④



CHECKING THE FRICTION PLATES

The following procedure applies to all of the friction plates.

1. Check:
 - Friction plate
Damage/wear → Replace the friction plate.
2. Measure:
 - Friction plate thickness
Out of specification → Replace the friction plate.

NOTE:

Measure the friction plate at four places.

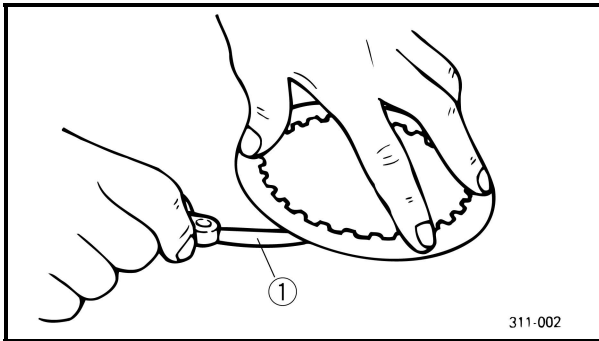


Friction plate thickness

2.9 ~ 3.1 mm (0.114 ~ 0.122 in)

Wear limit

2.8 mm (0.110 in)



CHECKING THE CLUTCH PLATES

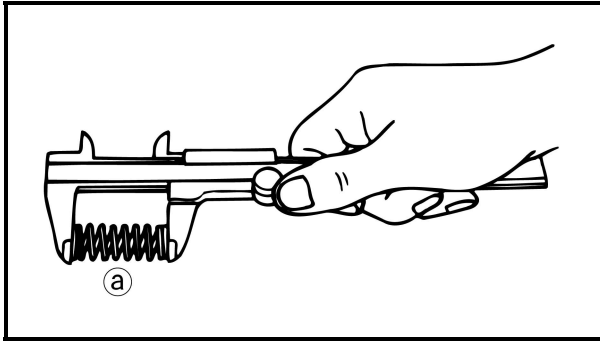
The following procedure applies to all of the clutch plates.

1. Check:
 - Clutch plate
Damage → Replace the clutch plate.
2. Measure:
 - Clutch plate warpage
(with a surface plate and thickness gauge
①)
Out of specification → Replace the clutch plate.



Warpage limit

0.2 mm (0.0079 in)



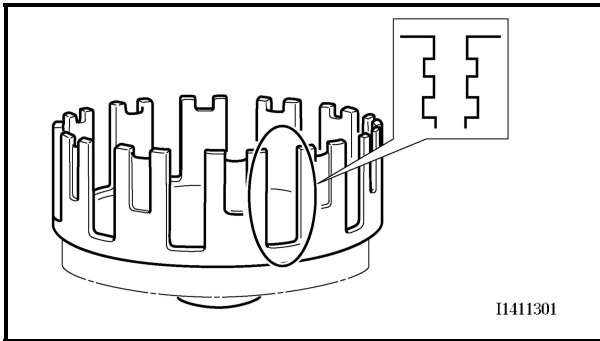
CHECKING THE CLUTCH SPRINGS

The following procedure applies to all of the clutch springs.

1. Check:
 - Clutch spring
Damage → Replace the clutch spring.
2. Measure:
 - Clutch spring free length (a)
Out of specification → Replace the clutch spring.



Clutch spring free length
47.80 mm (1.88 in)
Minimum length
46.50 mm (1.83 in)

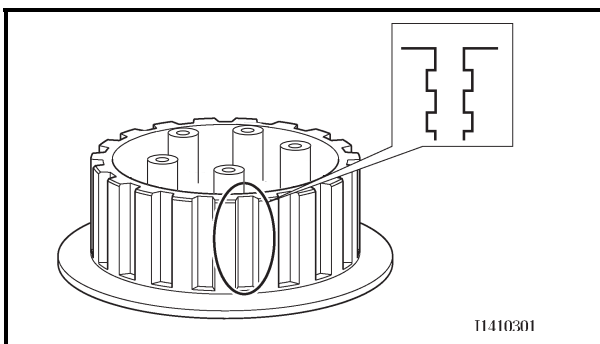


CHECKING THE CLUTCH HOUSING

1. Check:
 - Clutch housing dogs
Damage/pitting/wear → Deburr the clutch housing dogs or replace the clutch housing.

NOTE: _____

Pitting on the clutch housing dogs will cause erratic clutch operation.



CHECKING THE CLUTCH BOSS

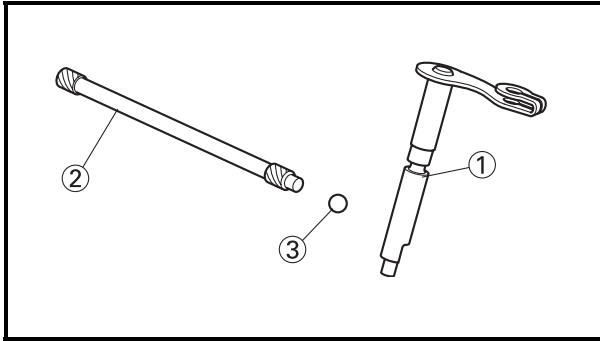
1. Check:
 - Clutch boss splines
Damage/pitting/wear → Replace the clutch boss.

NOTE: _____

Pitting on the clutch boss splines will cause erratic clutch operation.

CHECKING THE PRESSURE PLATE

1. Check:
 - Pressure plate
Cracks/damage → Replace.



CHECKING THE CLUTCH PUSH RODS

1. Check:

- Push lever shaft ①
- Push rod 2 ②
- Ball ③

Cracks/damage/wear → Replace the defective part(s).

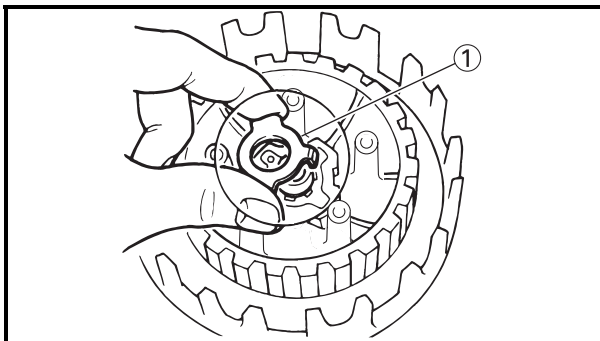
CHECKING THE PRIMARY DRIVE GEAR

1. Check:

- Primary drive gear
Damage/wear → Replace the primary drive and primary driven gears as a set.
Excessive noise during operation → Replace the primary drive and primary driven gears as a set.

2. Check:

- Primary-drive-gear-to-primary-driven-gear free play
Free play exists → Replace the primary drive and primary driven gears as a set.



INSTALLING THE CLUTCH

1. Install:

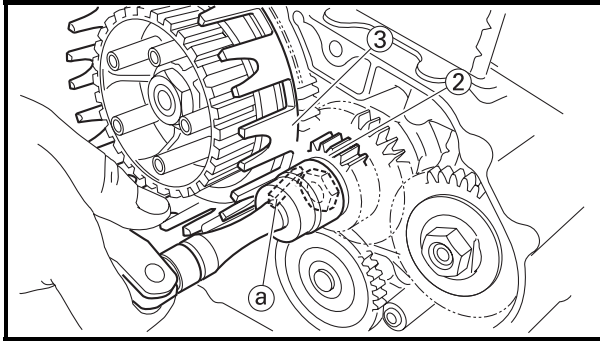
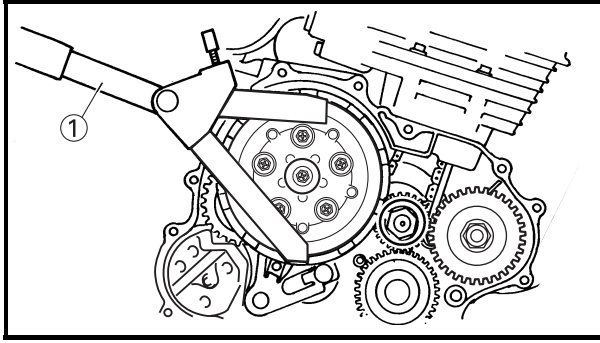
- Primary drive gear
- Claw washer
- Lock washer **New**
- Primary drive gear nut

2. Install:

- Clutch housing
- Thrust washer
- Clutch boss
- Lock washer ① **New**
- Clutch boss nut

NOTE: _____

Make sure the teeth on the lock washer are correctly aligned with the grooves on the clutch boss.



3. Tighten:
- Clutch boss nut
 - Primary drive gear nut



Clutch boss nut
75 Nm (7.5 m•kg, 55 ft•lb)
Primary drive gear nut
80 Nm (8.0 m•kg, 59 ft•lb)

NOTE:

- While holding the clutch boss with the universal clutch holder ①, tighten the clutch boss nut.
- Place the aluminum plate ① between primary drive gear ② and clutch housing ③, and then tighten the primary drive gear nut.



Universal clutch holder
90890-04086, YM-91042

4. Bend the lock washer tab along a flat side of the nut.
5. Lubricate:
- Friction plates
 - Clutch plates
(with the recommended lubricant)



Recommended lubricant
Engine oil

6. Install:
- Friction plates (6 piece)
 - Clutch plates (5 piece)

NOTE:

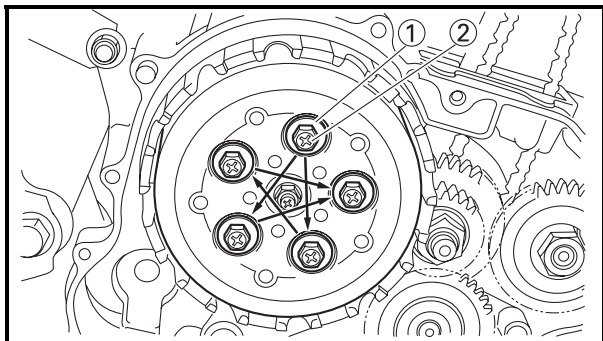
First, install a friction plate and then alternate between a clutch plate and a friction plate.



7. Install:
- Bearing
 - Oil seal **New**
 - Circlip **New**
 - Torsion spring
 - Push lever shaft
 - Bolt
 - Clutch cable

NOTE:

After installing the clutch cable, bend the push lever shaft tab along a flat side of the nut.



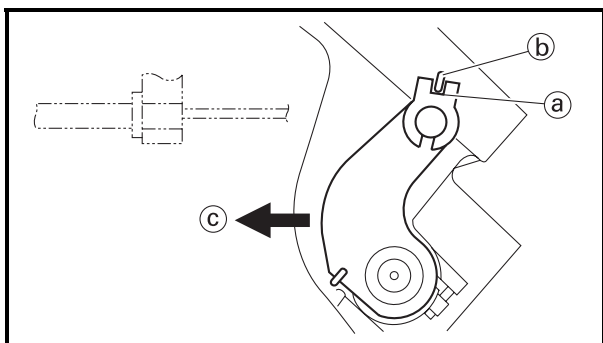
8. Install:
- Push rod 2
 - Ball
 - Push rod 1
 - Push plate
 - Washer
 - Locknut
 - Pressure plate
 - Clutch spring ①
 - Bolt ②
9. Tighten:
- Clutch spring bolt
 - Locknut



Clutch spring bolt
8 Nm (0.8 m•kg, 5.9 ft•lb)
Locknut
8 Nm (0.8 m•kg, 5.9 ft•lb)

NOTE:

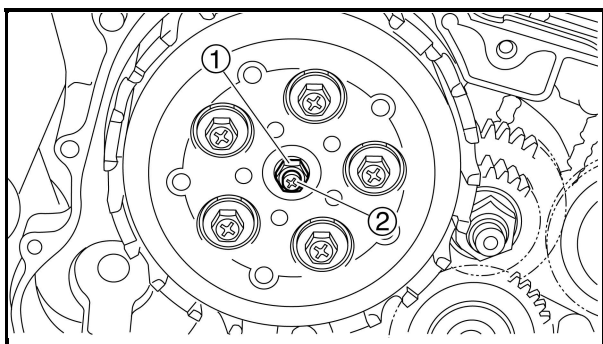
Tighten the clutch spring bolts in stages and in a crisscross pattern.



10. Check:
- Push lever position
 Push lever mark (a) and crankcase mark (b)
 not aligned → Correct.

NOTE:


Push the push lever in direction (c) and make sure the marks are aligned.



11. Adjust:
- Push lever position



- Loosen the locknut ①.
- Turn the adjusting screw ② in or out until the marks are aligned.
- Hold the adjusting screw to prevent it from moving and then tighten the locknut to specification.

 **8 Nm (0.8 m•kg, 5.9 ft•lb)**

CAUTION:

Do not overtighten the locknut since this will remove the free play between both push rods.



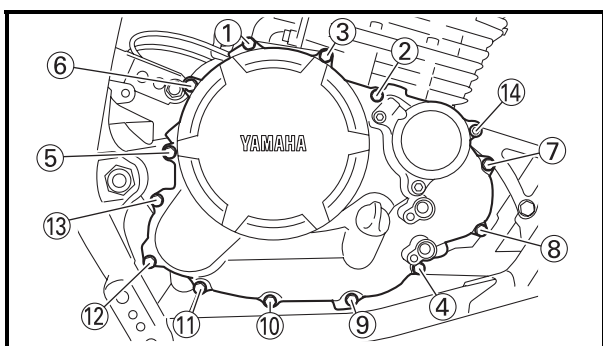
12. Check:
- Clutch cable free play
- Refer to “ADJUSTING THE CLUTCH CABLE FREE PLAY” in chapter 3.



Clutch lever free play
5 ~ 10 mm (0.20 ~ 0.39 in)

13. Install:
- Spacer
 - Dowel pin
 - Crankcase cover gasket **New**

14. Install:
- Right crankcase cover



15. Install:
- Crankcase cover bolts M6 × 50 mm ①, ②
 - Copper washers to ①, ②
 - Crankcase cover bolts M6 × 40 mm ③ ~ ⑥
 - Crankcase cover bolts M6 × 25 mm ⑦ ~ ⑬
 - Oil filter element cover bolt M6 × 70 mm ⑭

16. Tighten:
- Crankcase cover bolts ① ~ ⑬
 - Oil filter element cover bolt ⑭

NOTE:

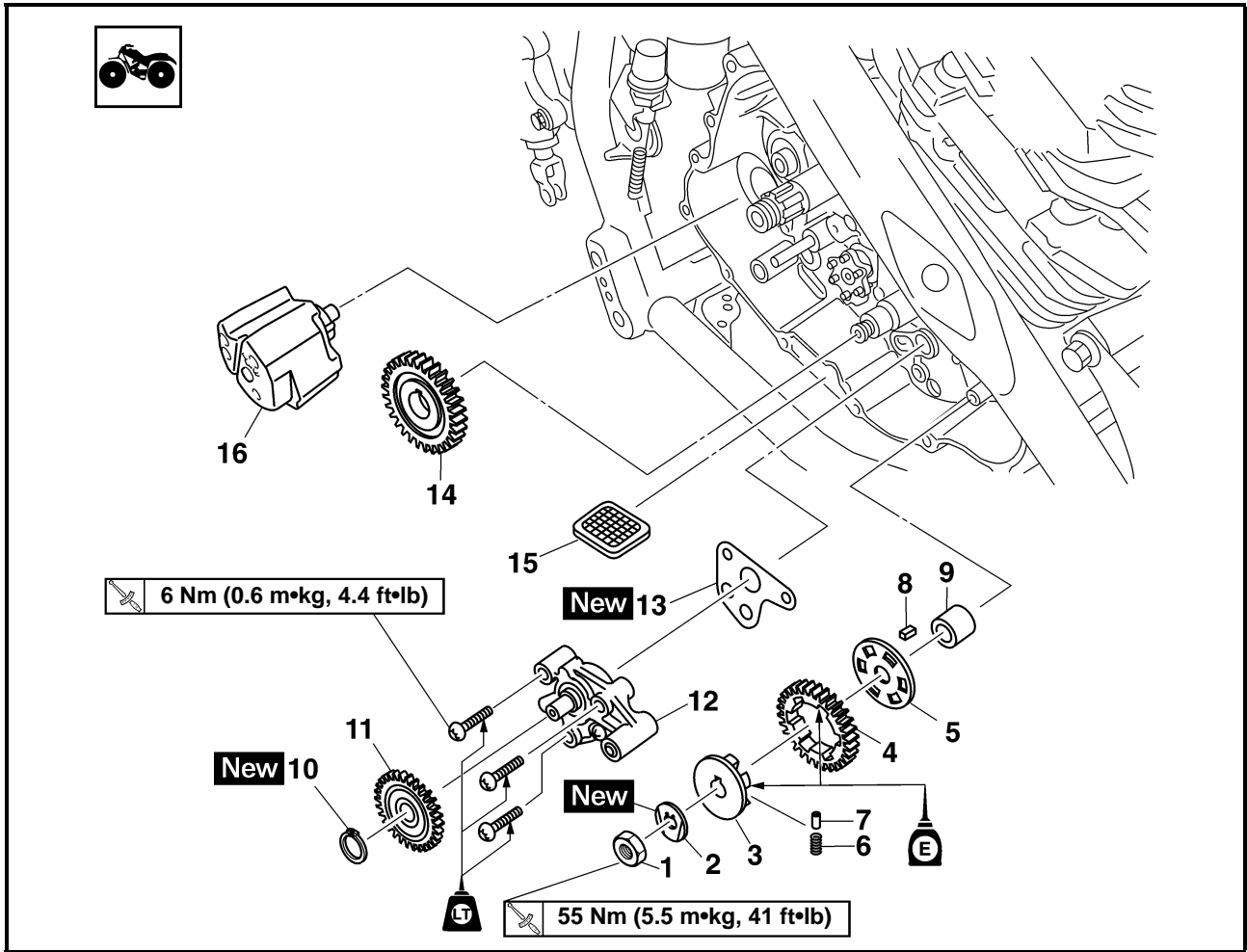
Tighten the bolts in stages, using a crisscross pattern.



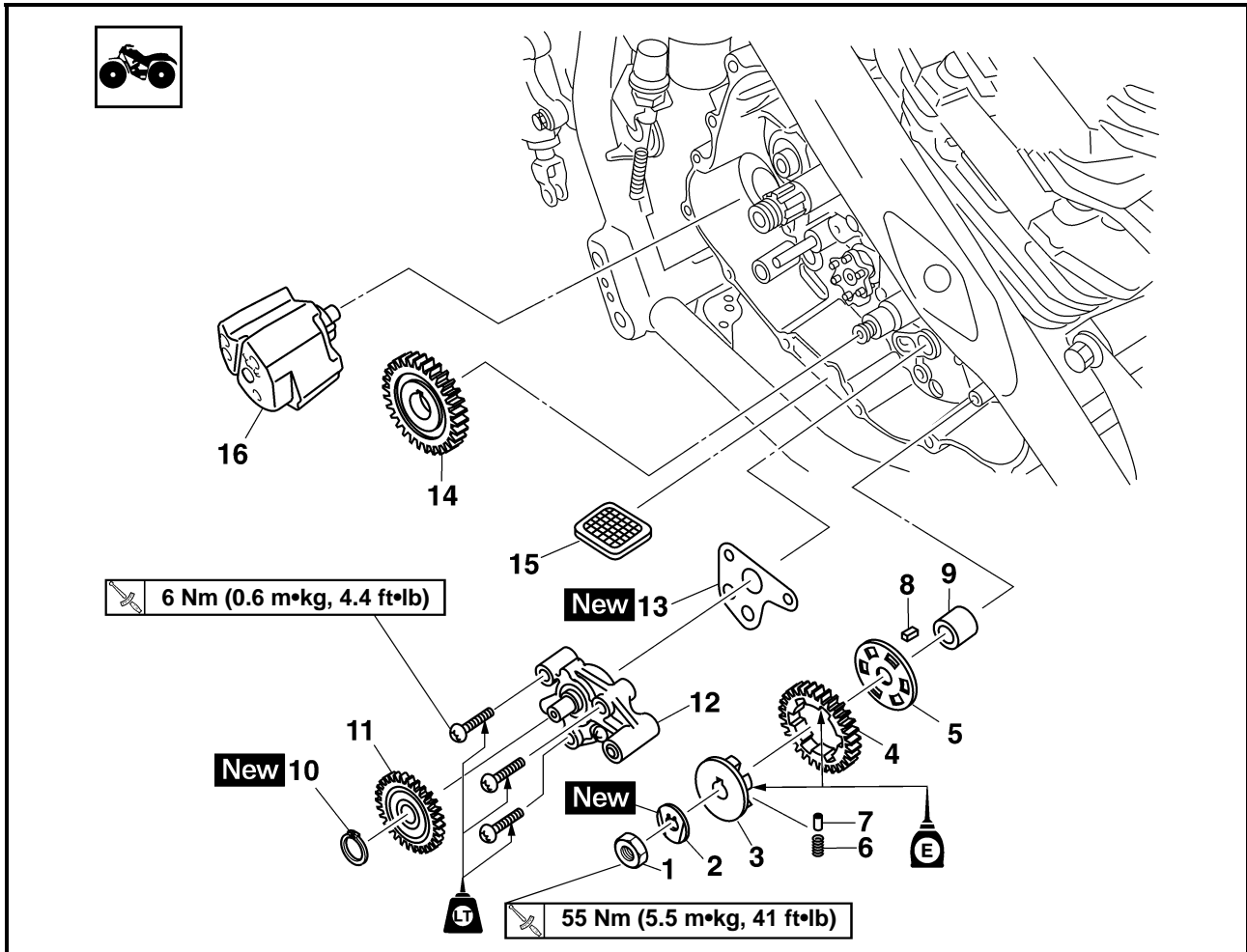
Crankcase cover bolt
10 Nm (1.0 m•kg, 7.4 ft•lb)
Oil filter element cover bolt
10 Nm (1.0 m•kg, 7.4 ft•lb)



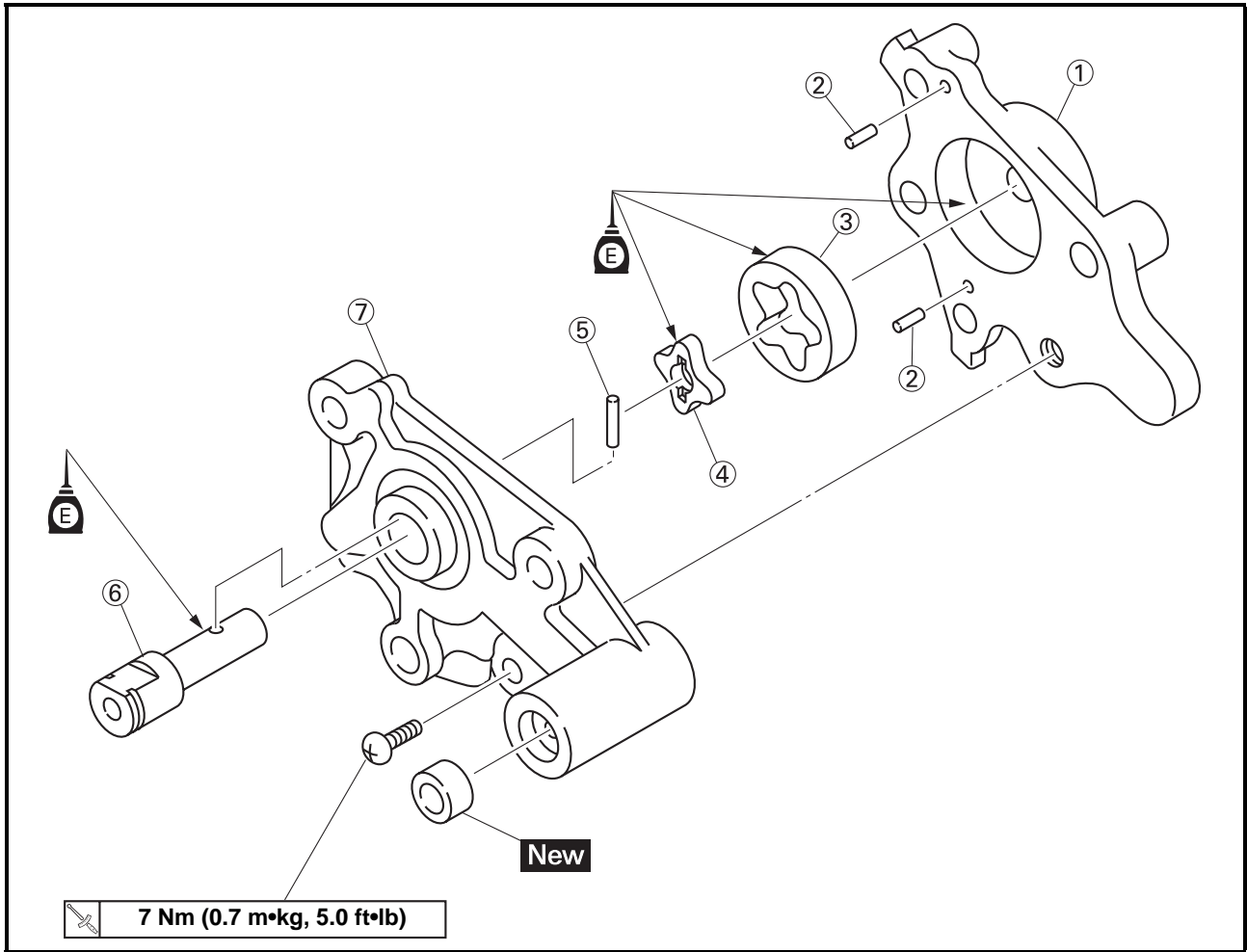
OIL PUMP AND BLANCER WEIGHT GEAR



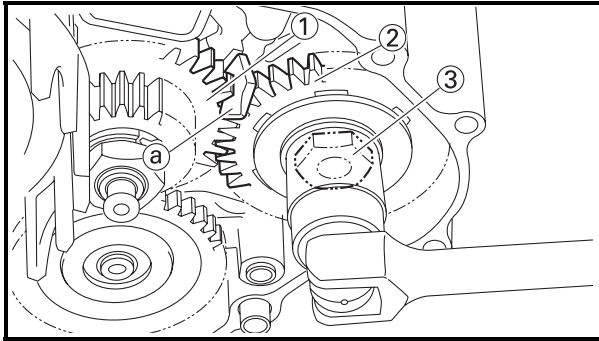
Order	Job/Parts to remove	Q'ty	Remarks
	Removing the oil pump and balancer weight gear		Remove the parts in the order listed.
	Right crankcase cover		Refer to "CLUTCH".
	Clutch		
	Primary drive gear		
1	Balancer weight gear nut	1	
2	Lock washer	1	
3	Buffer boss	1	
4	Balancer weight gear	1	
5	Absorber plate	1	
6	Compression spring	6	
7	Dowel pin	3	
8	Straight key	1	
9	Spacer	1	
10	Circlip	1	
11	Oil pump driven gear	1	
12	Oil pump assembly	1	
13	Gasket	1	



Order	Job/Parts to remove	Q'ty	Remarks
14	Balancer drive gear	1	For installation, reverse the removal procedure.
15	Oil strainer	1	
16	Spacer	1	



Order	Job/Parts to remove	Q'ty	Remarks
	Disassembling the oil pump		Remove the parts in the order listed.
①	Oil pump housing	1	
②	Dowel pin	2	
③	Outer rotor	1	
④	Inner rotor	1	
⑤	Dowel pin	1	
⑥	Shaft	1	
⑦	Oil pump cover	1	
			For assembly, reverse the disassembly procedure.



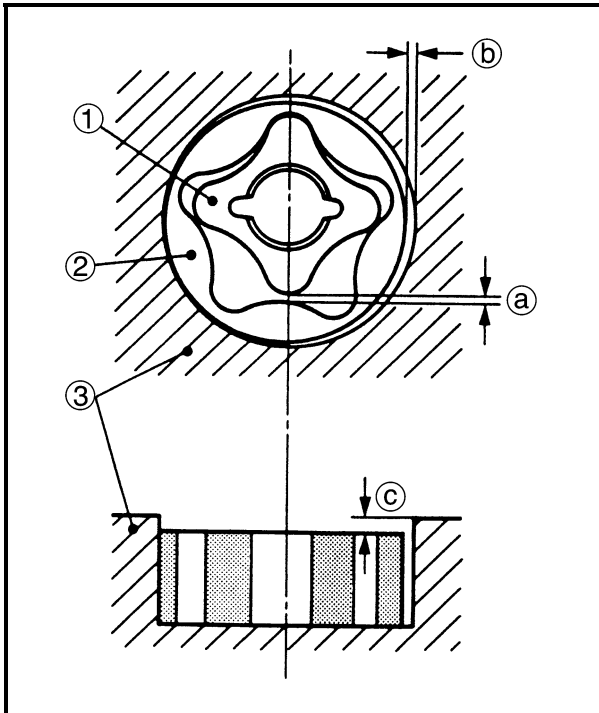
REMOVING THE BLANCER WEIGHT GEAR AND OIL PUMP

1. Straighten the lock washer tab.
2. Remove:
 - Blancer weight gear nut
 - Lock washer
 - Blancer weight gear

NOTE:

Place the aluminum plate (a) between blancer drive gear (1) and blancer weight gear (2), and then loosen the blancer weight gear nut (3).

3. Remove:
 - Oil pump assembly



CHECKING THE OIL PUMP

1. Check:
 - Oil pump driven gear
 - Oil pump housing
 - Oil pump cover
 Cracks/damage/wear → Replace the defective part(s).
 2. Measure:
 - Inner-rotor-to-outer-rotor-tip clearance (a)
 - Outer-rotor-to-oil-pump-housing clearance (b)
 - Oil-pump-housing-to-inner-rotor-and-outer-rotor clearance (c)
 Out of specification → Replace the oil pump.
- (1) Inner rotor
 (2) Outer rotor
 (3) Oil pump housing



**Inner-rotor-to-outer-rotor-tip
clearance**

0.150 mm (0.0059 in)

Limit

0.23 mm (0.0091 in)

**Outer-rotor-to-oil-pump-housing
clearance**

0.100 ~ 0.151 mm

(0.0039 ~ 0.0059 in)

Limit

0.22 mm (0.0087 in)

**Oil-pump-housing-to-inner-and-
outer-rotor clearance**

0.04 ~ 0.09 mm

(0.0016 ~ 0.0035 in)

Limit

0.16 mm (0.0063 in)

3. Check:

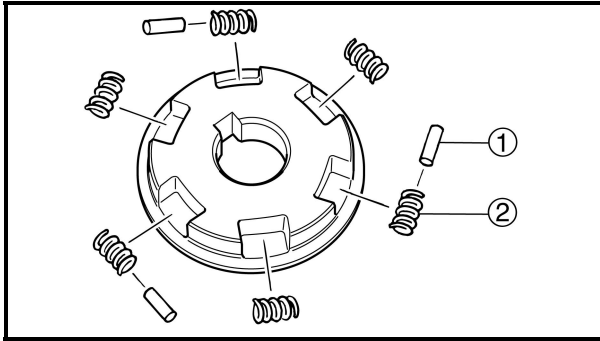
- Oil pump operation

Rough movement → Repeat steps (1) and (2) or replace the defective part(s).

CHECKING THE BLANCER WEIGHT GEAR

1. Check:

- Balancer weight gear
- Buffer boss
- Compression spring
- Dowel pin
- Cracks/damage/wear → Replace.



ASSEMBLING THE BALANCER DRIVE GEAR

1. Assemble:
 - Dowel pin ①
 - Compression spring ②

NOTE: _____

Install the dowel pins and compression springs alternately as shown as.

2. Assemble:
 - Buffer boss

INSTALLING THE OIL PUMP

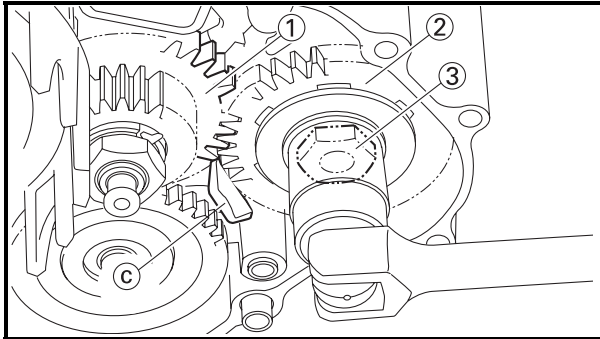
1. Install:
 - Gasket **New**
 - Oil pump
2. Tighten:
 - Oil pump bolts



Oil pump bolt
 6 Nm (0.6 m•kg, 4.4 ft•lb)
 LOCTITE®

CAUTION: _____

After tightening the bolts, make sure the oil pump turns smoothly.



INSTALLING THE BLANCER WEIGHT GEAR

1. Install:
 - Balancer weight gear
 - Lock washer **New**
 - Balancer weight gear nut
2. Tighten:
 - Balancer weight gear nut



Balancer weight gear nut
55 Nm (5.5 m•kg, 41 ft•lb)

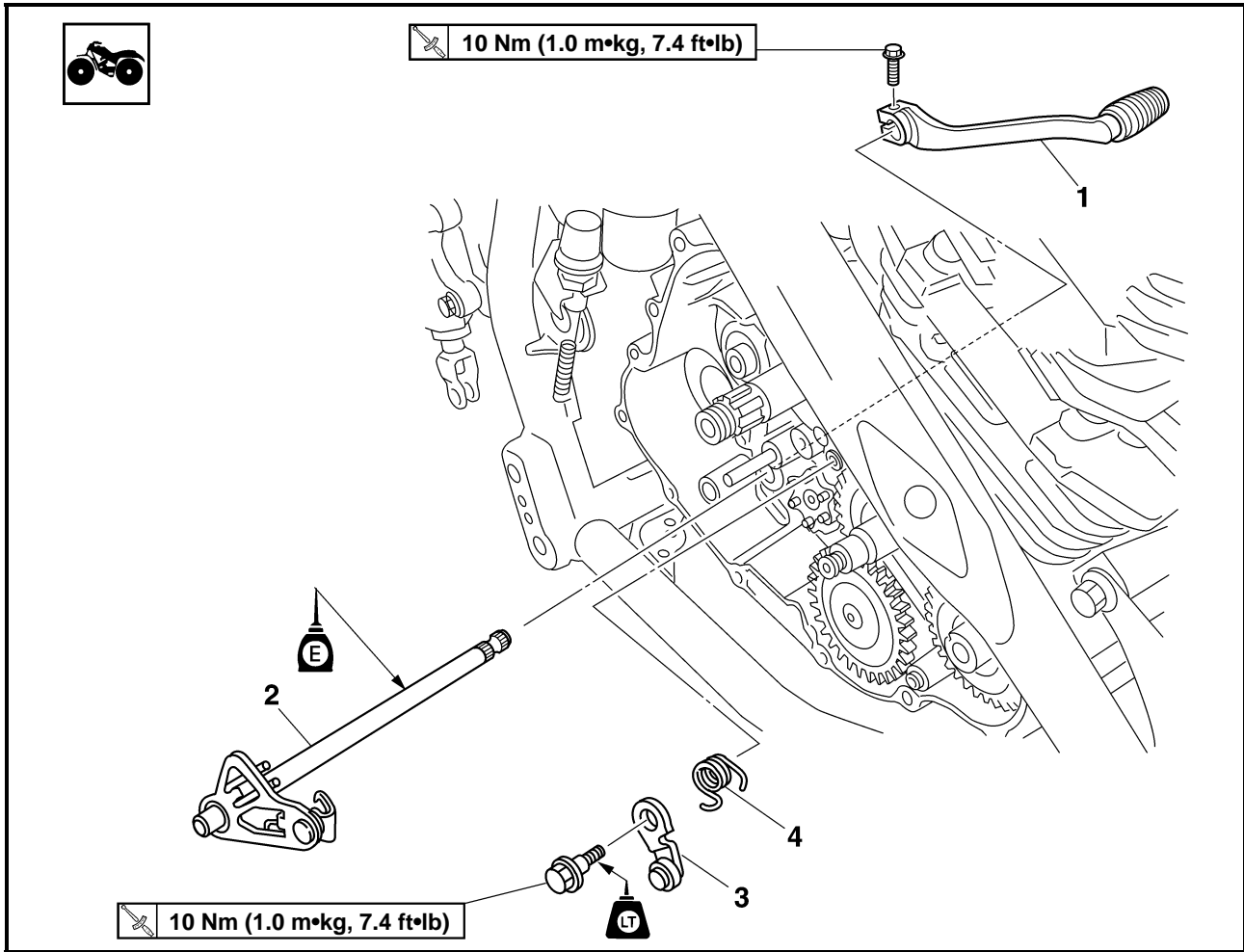
NOTE:

- Align the punch mark (a) in the balancer drive gear with the punch mark (b) in the balancer weight gear.
- Place the aluminum plate (c) between balancer drive gear (1) and balancer weight gear (2), and then tighten the balancer weight gear nut (3).

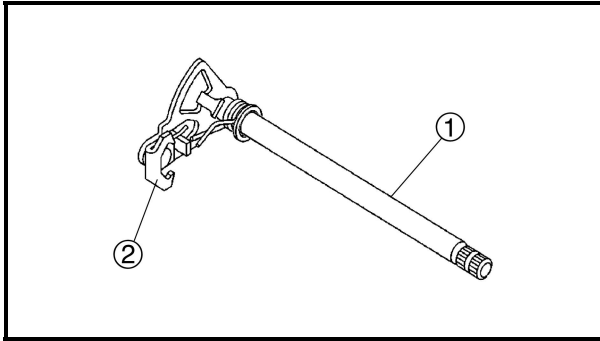
3. Bend the lock washer tab along a flat side of the nut.



SHIFT SHAFT

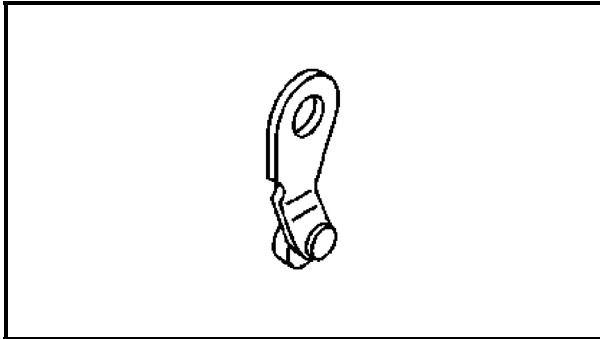


Order	Job/Parts to remove	Q'ty	Remarks
	Removing the shift shaft and stopper lever		Remove the parts in the order listed.
	Right crankcase cover		Refer to "CLUTCH".
	Clutch		
1	Shift pedal	1	
2	Shift shaft assembly	1	
3	Stopper lever	1	
4	Torsion spring	1	
			For installation, reverse the removal procedure.



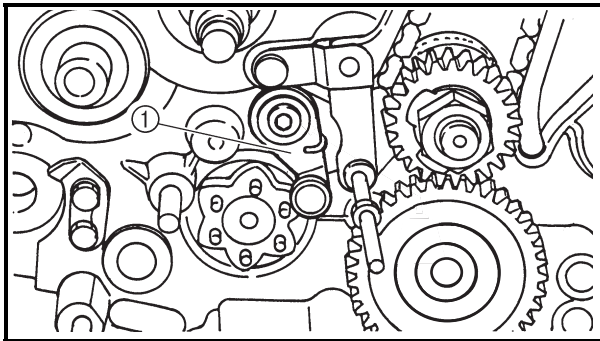
CHECKING THE SHIFT SHAFT

1. Check:
 - Shift shaft ①
 - Shift lever ②
 - Bends/damage/wear → Replace.
 - Shift lever spring
 - Damage/wear → Replace.



CHECKING THE STOPPER LEVER

1. Check:
 - Stopper lever
 - Bends/damage → Replace.
 - Roller turns roughly → Replace the stopper lever.
 - Torsion spring
 - Damage/wear → Replace.



INSTALLING THE SHIFT SHAFT

1. Install:
 - Stopper lever ①

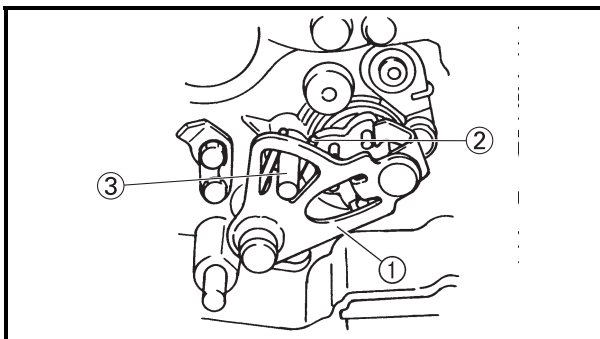
NOTE: _____

- Hook the ends of the stopper lever spring onto the stopper lever and the crankcase boss.
- Mesh the stopper lever with the shift drum segment assembly.

2. Tighten:
 - Stopper lever bolt



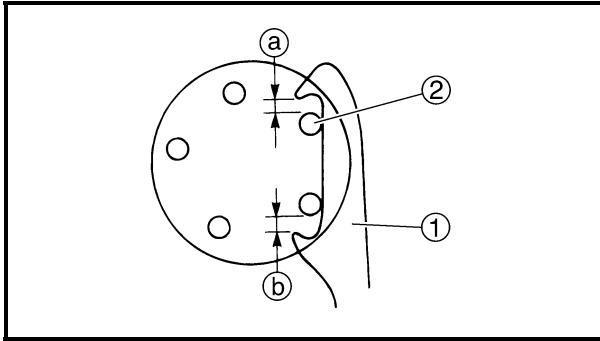
Stopper lever bolt
10 Nm (1.0 m•kg, 7.4 ft•lb)
LOCTITE®



3. Install:
 - Shift shaft ①

NOTE: _____

Install the shift shaft ① by aligning the shift shaft spring ② with the stopper ③.



4. Check:

- When the gear position is in Neutral, check the length (a, b) between the tip of the shift lever (1) and dowel pin (2) are equal. If not → Replace the shift shaft.

5. Install:

- Shift pedal

6. Tighten:

- Shift pedal bolt

**Shift pedal bolt****10 Nm (1.0 m•kg, 7.4 ft•lb)**

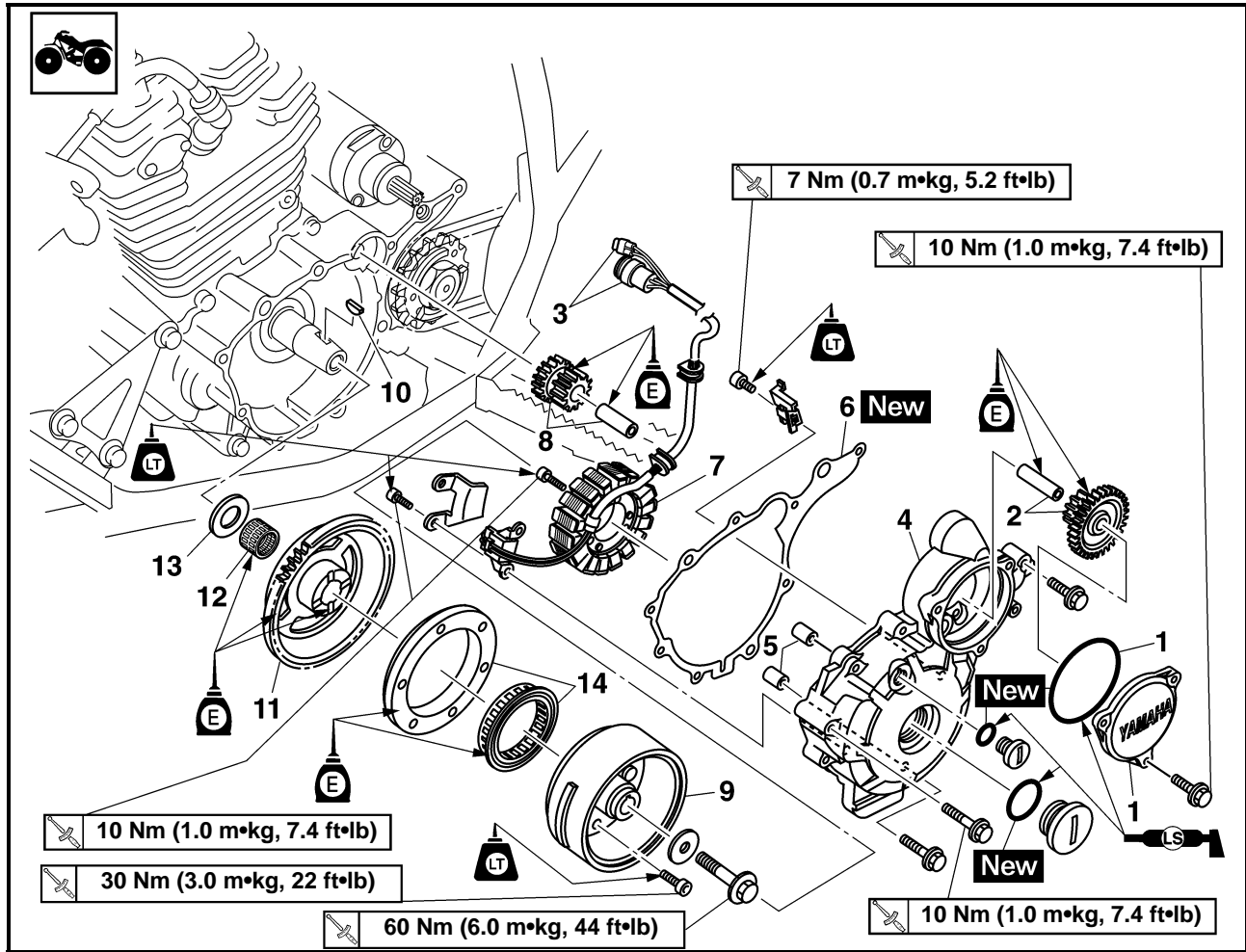
7. Adjust:

- Shift pedal height

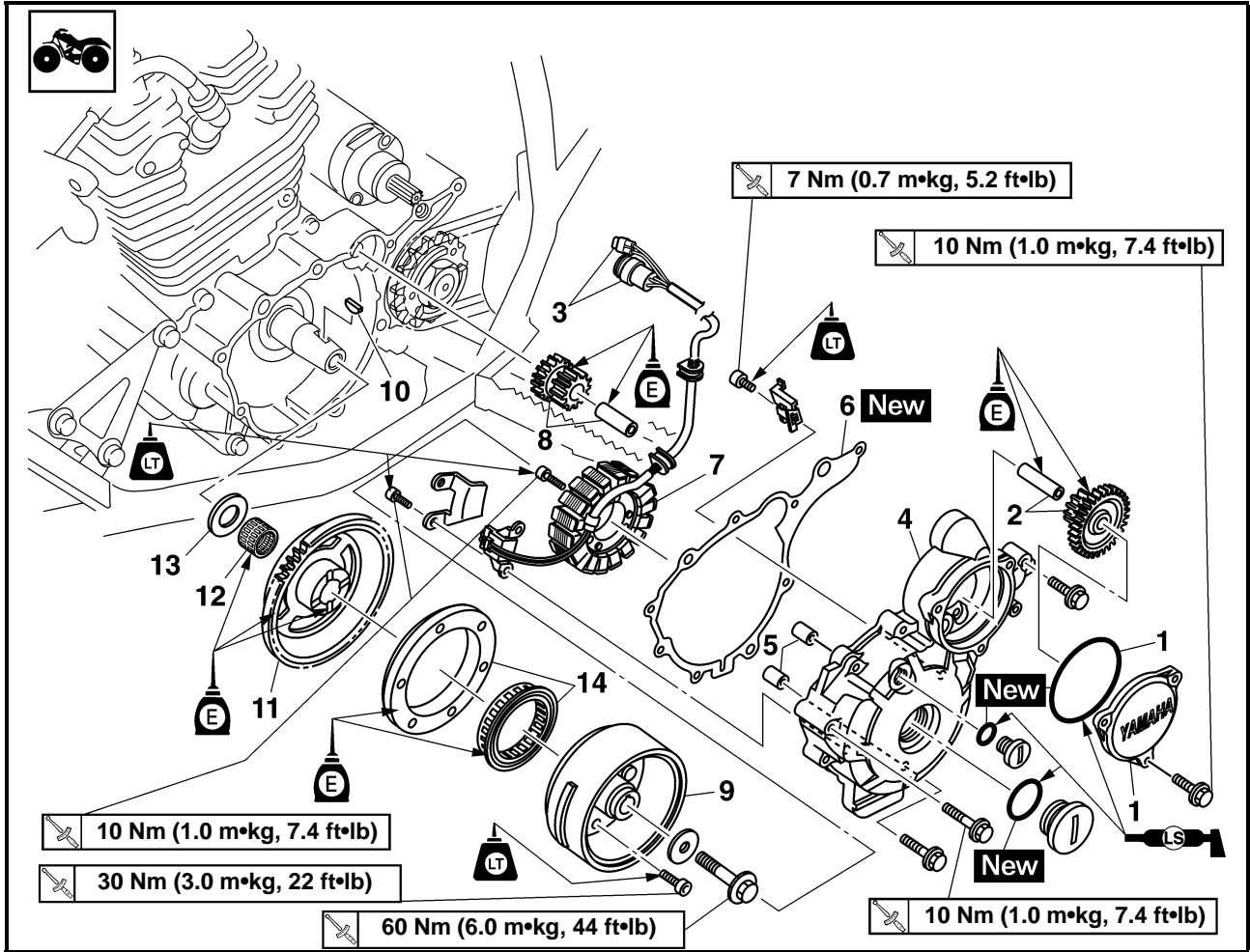
Refer to "ADJUSTING THE SHIFT PEDAL" in chapter 3.



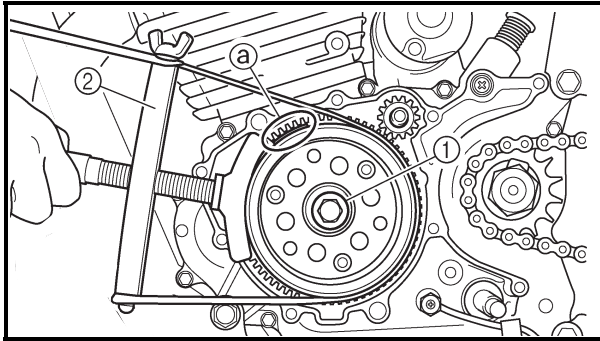
PICKUP COIL ROTOR AND STARTER CLUTCH



Order	Job/Parts to remove	Q'ty	Remarks
	Removing the pickup coil rotor and starter clutch		Remove the parts in the order listed.
	Engine oil		Drain.
	Shift pedal		Refer to "SHIFT SHAFT".
	Drive sprocket cover		Refer to "REAR SHOCK ABSORBER, SWINGARM AND DRIVE CHAIN" in chapter 6.
1	Starter idle gear cover/O-ring	1/1	
2	Starter idler gear 1/shaft	1/1	
3	Pickup coil rotor lead coupler	2	Disconnect.
4	Left crankcase cover	1	
5	Dowel pin	2	
6	Crank case cover gasket	1	
7	Stator coil assembly/pickup coil	1/1	
8	Starter idler gear 2/shaft	1/1	
9	Pickup coil rotor	1	
10	Woodruff key	1	
11	Starter wheel gear	1	



Order	Job/Parts to remove	Q'ty	Remarks
12	Bearing	1	For installation, reverse the removal procedure.
13	Washer	1	
14	Starter clutch assembly	1	



REMOVING THE PICKUP COIL ROTOR

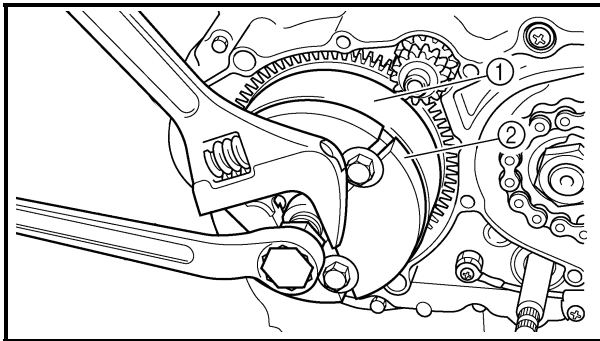
1. Remove:
 - Pickup coil rotor bolt (1)
 - Washer

NOTE:

- Loosen the pickup coil rotor bolt (1) while holding the rotor with a sheave holder (2).
- Do not allow the sheave holder to touch the projection on the rotor (a).



Sheave holder
90890-01701
Primary clutch holder
YS-01880-A



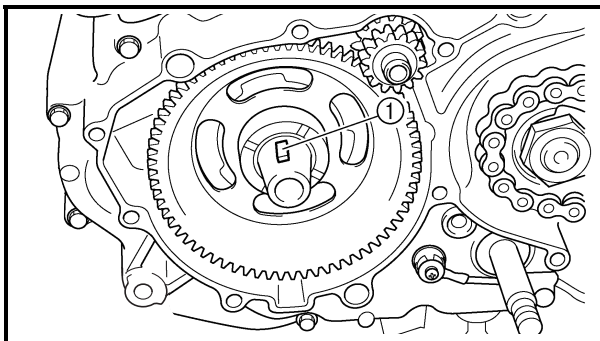
2. Remove:
 - Pickup coil rotor (1)

NOTE:

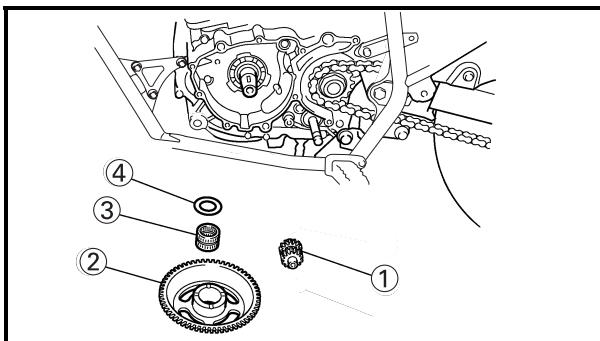
Remove the rotor using flywheel puller (2).



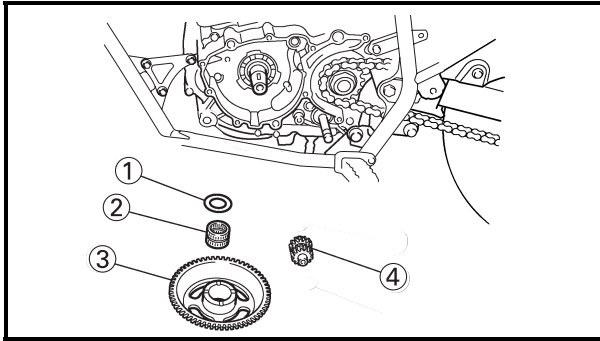
Flywheel puller
90890-01362
Heavy duty puller
YU-33270-B
Bolt (M8 × 80 mm)
90890-01359



3. Remove:
 - Woodruff key (1)

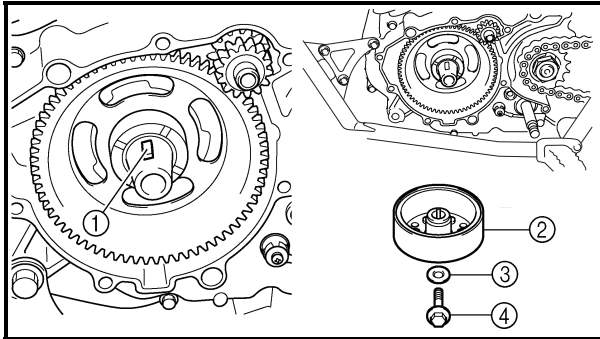


4. Remove:
 - Starter idle gear 2 (1)
 - Starter wheel gear (2)
 - Bearing (3)
 - Washer (4)



INSTALLING THE PICKUP COIL ROTOR

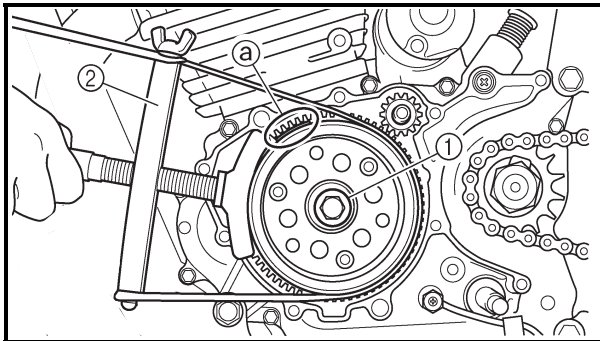
1. Install:
 - Washer ①
 - Bearing ②
 - Starter wheel gear ③
 - Starter idle gear 2 ④



2. Install:
 - Woodruff key ①
 - Pickup coil rotor ②
 - Washer ③
 - Pickup coil rotor bolt ④

NOTE:

- Clean the tapered portion of the crankshaft and the rotor hub.
- When installing the rotor, make sure the woodruff key is properly seated in the key way of the crankshaft.



3. Tighten:
 - Pickup coil rotor bolt ①



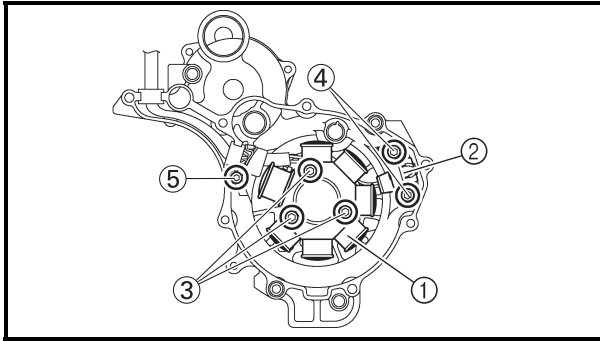
Pickup coil rotor bolt
60 Nm (6.0 m•kg, 44 ft•lb)

NOTE:

- Tighten the pickup coil rotor bolt ① while holding the rotor with a sheave holder ②.
- Do not allow the sheave holder to touch the projection on the rotor ①a.



Sheave holder
90890-01701
Primary clutch holder
YS-01880-A



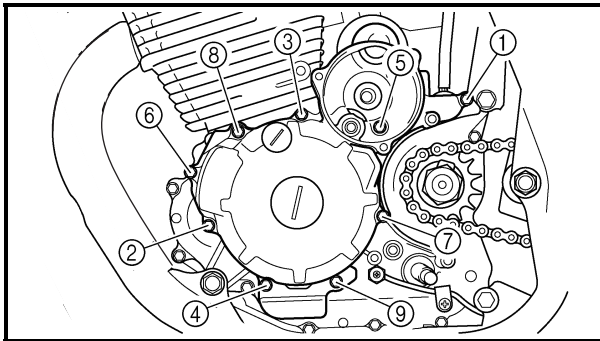
4. Install:
 - Stater coil ①
 - Pickup coil ②
5. Tighten:
 - Stater coil bolts ③
 - Pickup coil bolts ④
 - Left crankcase cover bolt ⑤



Stater coil bolt
 10 Nm (1.0 m•kg, 7.4 ft•lb)
 LOCTITE®

Pickup coil bolt
 10 Nm (1.0 m•kg, 7.4 ft•lb)
 LOCTITE®

Left crankcase cover bolt
 7 Nm (0.7 m•kg, 5.2 ft•lb)
 LOCTITE®



6. Install:
 - Dowel pin
 - Crankcase cover gasket **New**
7. Install:
 - Left crankcase cover
8. Install:
 - Crankcase cover bolts M6 × 30 mm ① ~ ⑤
 - Crankcase cover bolt M6 × 45 mm ⑥
 - Crankcase cover bolts M6 × 40 mm ⑦ ~ ⑨
9. Tighten:
 - Crankcase cover bolts ① ~ ⑨

NOTE: _____
 Tighten the bolts in stages and in a crisscross pattern as shown.



Crankcase cover bolt
 10 Nm (1.0 m•kg, 7.2 ft•lb)

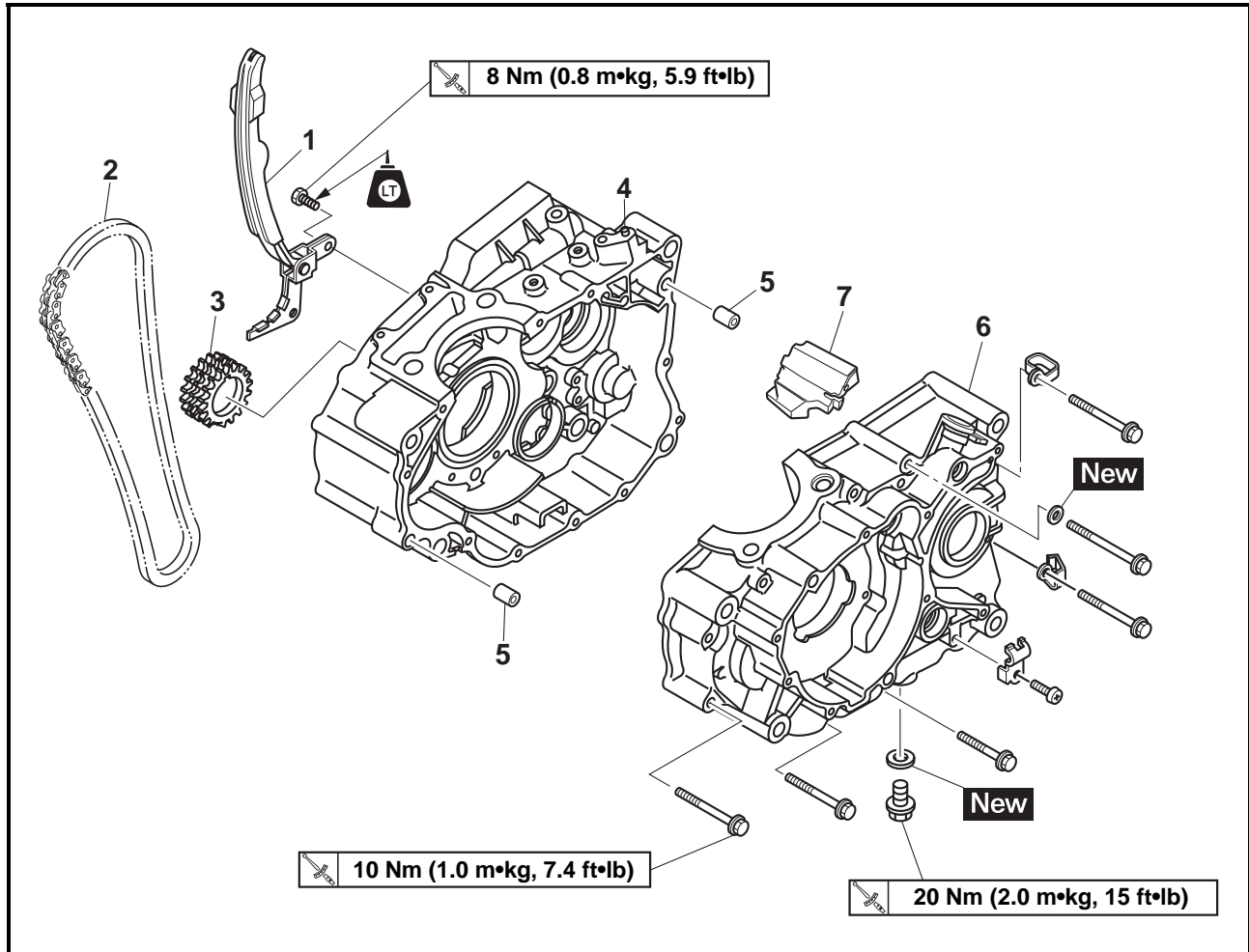
10. Install:
 - Starter idle gear 1
 - Shaft
11. Install:
 - O-ring **New**
 - Starter idle gear cover
12. Tighten:
 - Starter idle gear cover bolt



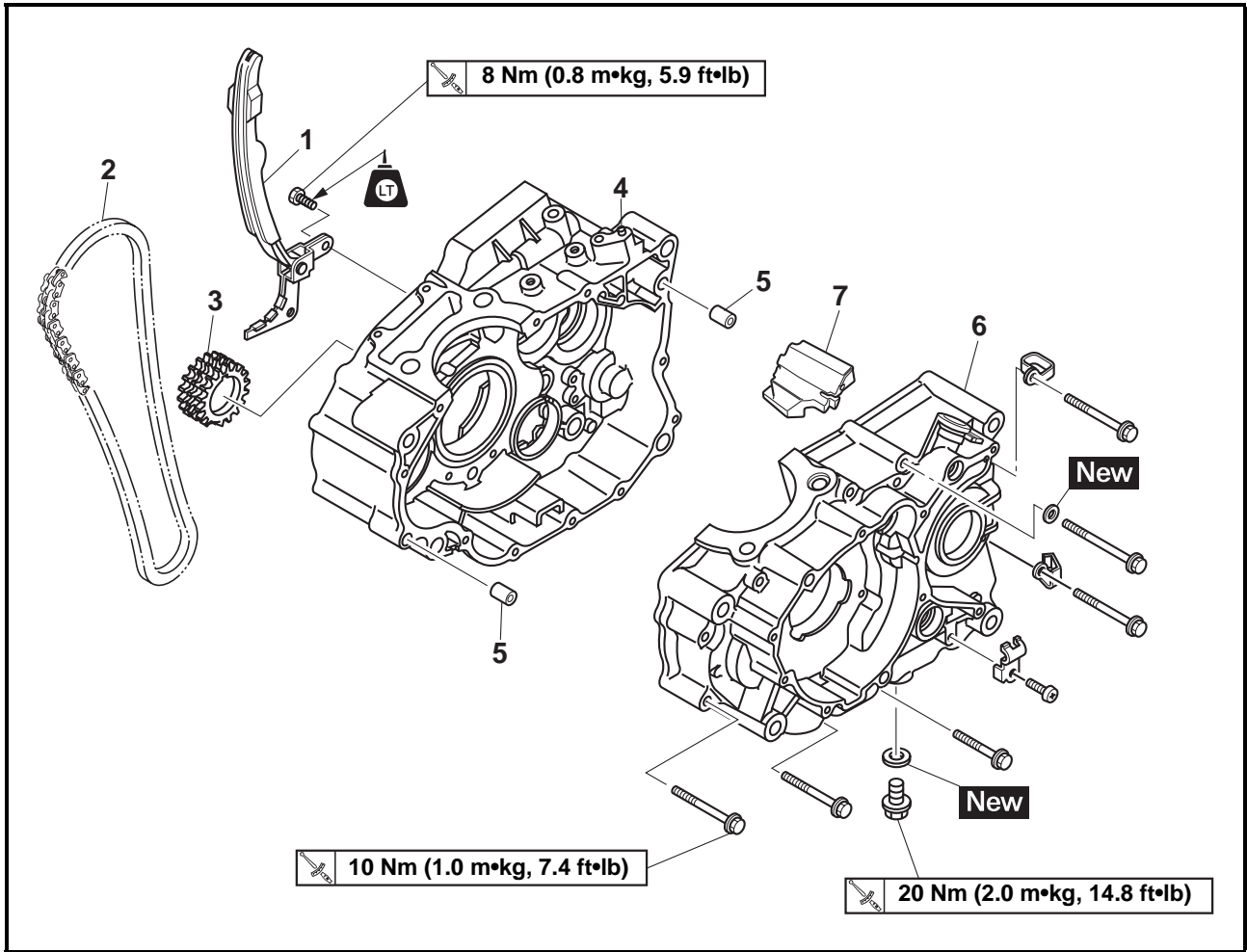
Starter idle gear cover bolt
 10 Nm (1.0 m•kg, 7.4 ft•lb)



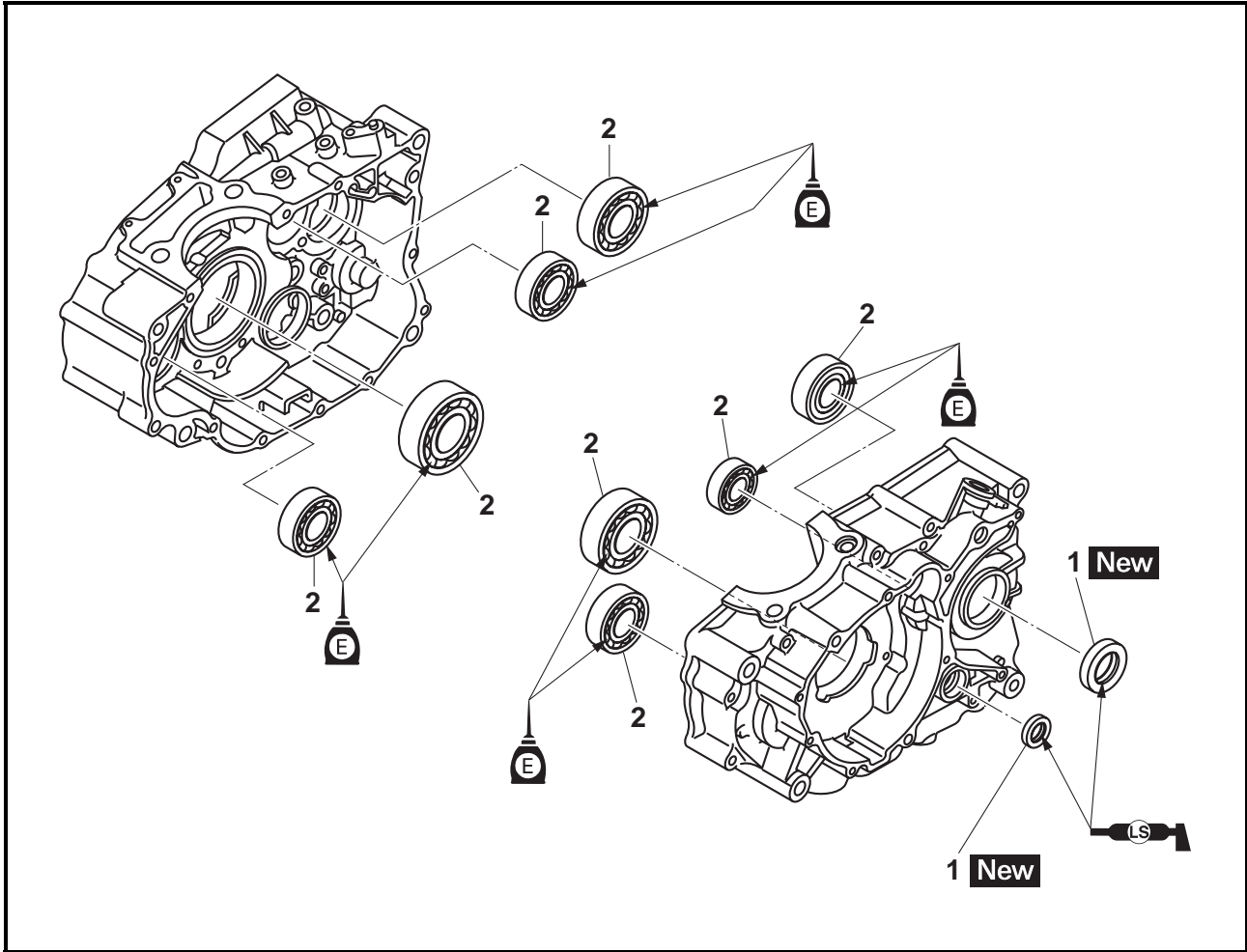
CRANKCASE



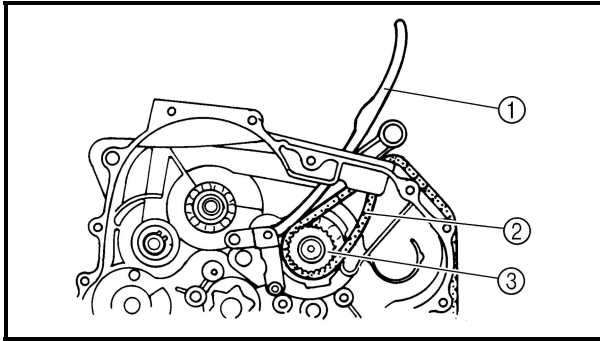
Order	Job/Parts to remove	Q'ty	Remarks
	Separating the crankcase		Remove the parts in the order listed.
	Engine		Refer to "ENGINE REMOVAL".
	Cylinder head		Refer to "CYLINDER HEAD".
	Cylinder		Refer to "CYLINDER AND PISTON".
	Clutch		Refer to "CLUTCH".
	Oil pump		Refer to "OIL PUMP AND BLANCER WEIGHT GEAR".
	Balancer weight gear		
	Shift shaft		Refer to "SHIFT SHAFT".
	Pickup coil rotor		Refer to "PICKUP COIL ROTOR AND STARTER CLUTCH".
1	Timing chain guide (intake side)	1	
2	Timing chain	1	
3	Crankshaft sprocket	1	
4	Right crankcase	1	
5	Dowel pin	2	
6	Left crankcase	1	



Order	Job/Parts to remove	Q'ty	Remarks
7	Spacer	1	For installation, reverse the removal procedure.

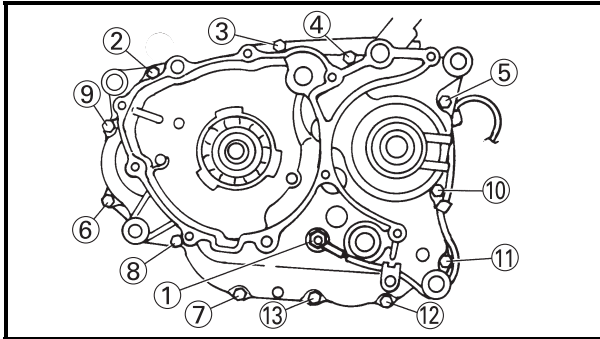


Order	Job/Parts to remove	Q'ty	Remarks
	Removing the bearing		
	Crankshaft assembly		Remove the parts in the order listed.
	Main axle assembly/drive axle assembly		Refer to "CRANKSHAFT ASSEMBLY".
1	Oil seal	2	Refer to "TRANSMISSION".
2	Bearing	8	
			For installation, reverse the removal procedure.



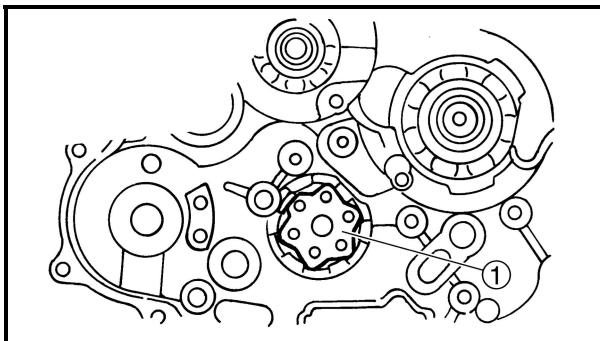
DISASSEMBLING THE CRANKCASE

1. Remove:
 - Timing chain guide (intake side) ①
 - Timing chain ②
 - Crankshaft sprocket ③



2. Remove:
 - Neutral switch ①
 - Crankcase bolts M6 × 70 mm ② ~ ④
 - Copper washers
 - Crankcase bolts M6 × 60 mm ⑤, ⑥
 - Crankcase bolts M6 × 55 mm ⑦ ~ ⑨
 - Crankcase bolts M6 × 45 mm ⑩ ~ ⑬

NOTE: _____
 Loosen each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern. After all of the bolts are fully loosened, remove them.



3. Turn:
 - Shift drum segment

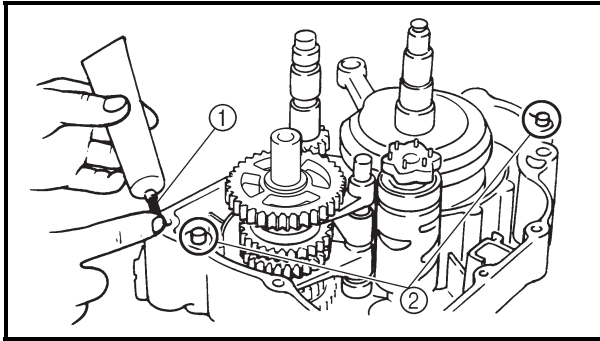
NOTE: _____
 Turn the shift drum segment ① to the position shown in the illustration. In this position, the shift drum segment's teeth will not contact the crankcase during crankcase separation.

4. Remove:
 - Right crankcase

CAUTION: _____
 • First check that the shift drum segment's teeth and the drive axle circlip are properly positioned, then remove the right crankcase.
 • Do not damage the crankcase mating surfaces.

**CHECKING THE CRANKCASE**

1. Thoroughly wash the crankcase halves in a mild solvent.
2. Thoroughly clean all the gasket surfaces and crankcase mating surfaces.
3. Check:
 - Crankcase
Cracks/damage → Replace.
 - Oil delivery passages
Obstruction → Blow out with compressed air.

**ASSEMBLING THE CRANKCASE**

1. Apply:
 - Yamaha bond No.1215 (Three Bond No.1215[®]) ①
(onto the crankcase mating surfaces)



**Yamaha bond No.1215
(Three Bond No.1215[®])
90890-85505**

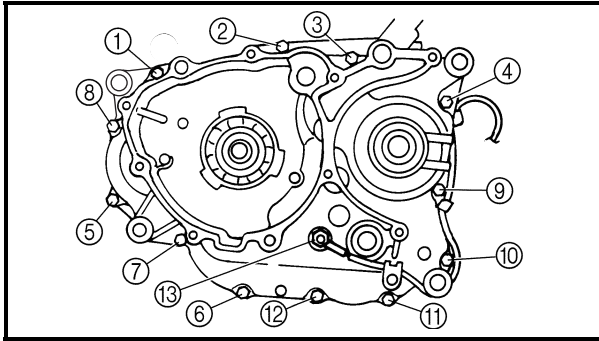
NOTE: _____

Do not allow any sealant to come into contact with the oil gallery.

2. Install:
 - Dowel pins ②
3. Install:
 - Right crankcase
(onto the left crankcase)

NOTE: _____

Tap lightly on the right crankcase with a soft-face hammer.



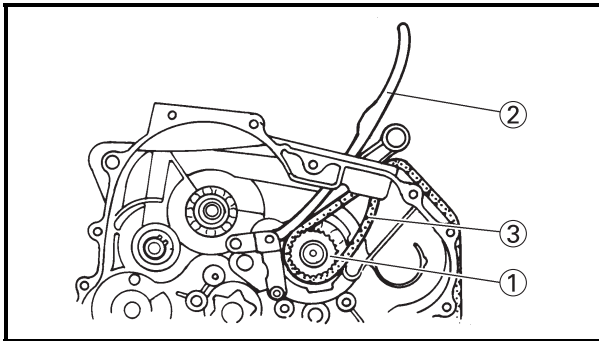
4. Install:
 - Crankcase bolts M6 × 70 mm ① ~ ③
 - Copper washers to ① ~ ③.
 - Crankcase bolts M6 × 60 mm ④, ⑤
 - Crankcase bolts M6 × 55 mm ⑥ ~ ⑧
 - Crankcase bolts M6 × 45 mm ⑨ ~ ⑫
5. Tighten:
 - Crankcase bolts ① ~ ⑫



Crankcase bolt
10 Nm (1.0 m•kg, 7.4 ft•lb)

NOTE: _____
 Tighten each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern.

6. Install:
 - Neutral switch ⑬



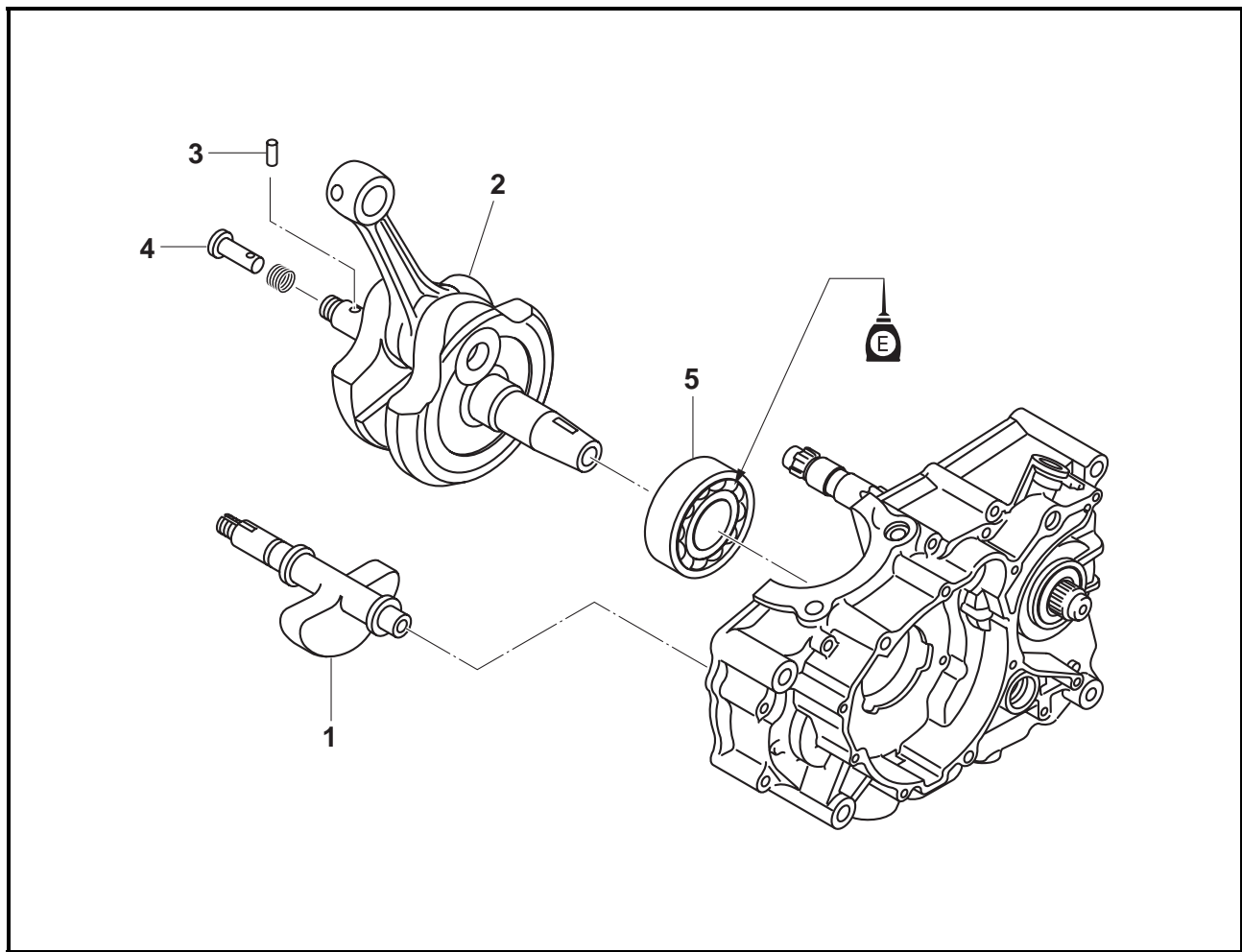
7. Install:
 - Crankshaft sprocket ①
 - Timing chain guide (intake side) ②
 - Timing chain ③
8. Tighten:
 - Timing chain guide (intake side) bolt



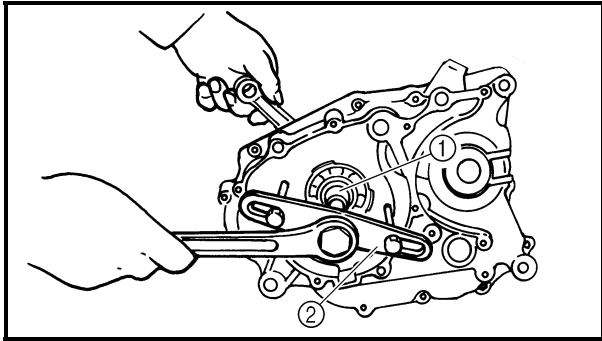
Timing chain guide (intake side) bolt
8 Nm (0.8 m•kg, 5.9 ft•lb)
LOCTITE®

9. Apply:
 - Engine oil
 (onto the crankshaft pins bearings and oil delivery holes)
10. Check:
 - Crankshaft and transmission operation
 Rough movement → Repair.

CRANKSHAFT ASSEMBLY



Order	Job/Parts to remove	Q'ty	Remarks
	Removing the crankshaft assembly		Remove the parts in the order listed. Refer to "CRANKCASE".
1	Balancer weight	1	
2	Crankshaft assembly	1	
3	Dowel pin	1	
4	Plunger seal	1	
5	Bearing	1	
			For installation, reverse the removal procedure.



REMOVING THE CRANKSHAFT ASSEMBLY

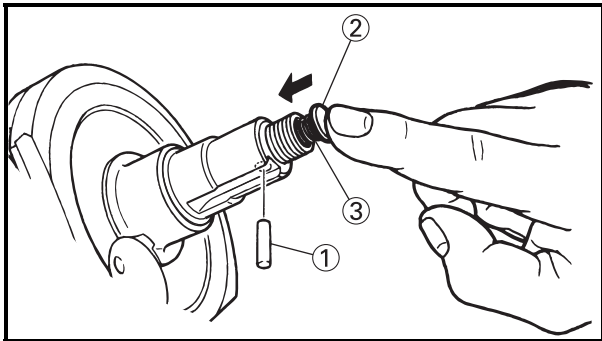
1. Remove:
 - Balancer weight
 - Crankshaft assembly ①

NOTE:

- Remove the crankshaft assembly with the crankcase separating tool ②.
- Make sure the crankcase separating tool is centered over the crankshaft assembly.

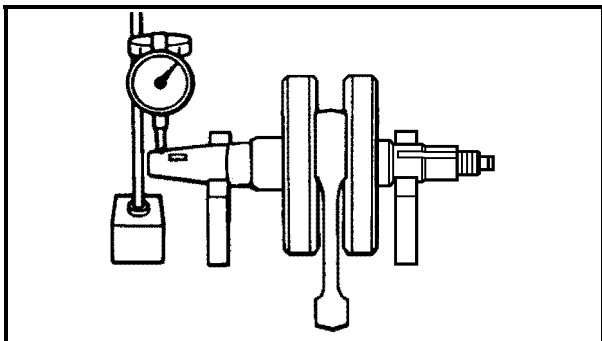


Crankcase separating tool
90890-01135
Crankcase separator
YU-01135-B



REMOVING THE PLUNGER SEAL

1. Remove:
 - Dowel pin ①
 - Plunger seal ②
 - Compression spring ③
 Remove the plunger seal and compression spring, push the plunger seal lightly and remove the dowel pin.



CHECKING THE CRANKSHAFT AND CONNECTING ROD

1. Measure:
 - Crankshaft runout
 Out of specification → Replace the crankshaft, bearing or both.

NOTE:

Turn the crankshaft slowly.



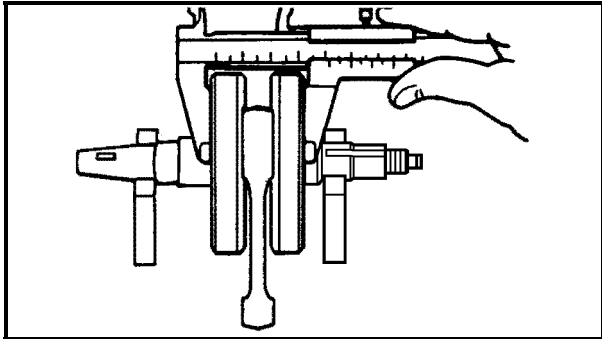
Runout limit C
0.03 mm (0.0012 in)



2. Measure:
 - Big end side clearance
 - Out of specification → Replace the big end bearing, crankshaft pin, or connecting rod.



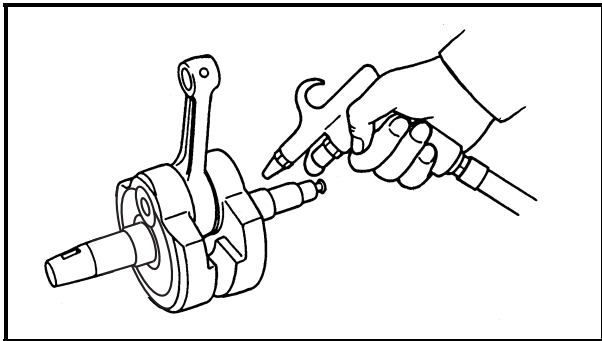
Big end side clearance D
 0.350 ~ 0.650 mm
 (0.0138 ~ 0.0256 in)



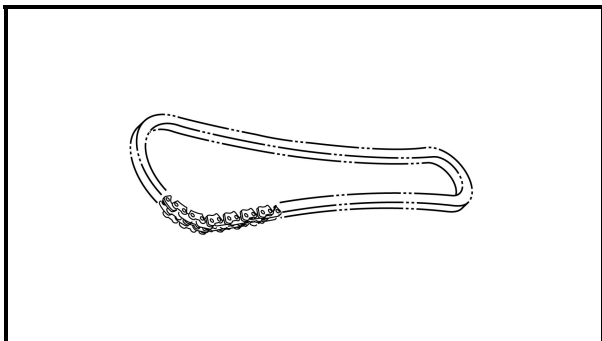
3. Measure:
 - Crankshaft width
 - Out of specification → Replace the crankshaft.



Width A
 69.25 ~ 69.30 mm
 (2.726 ~ 2.728 in)



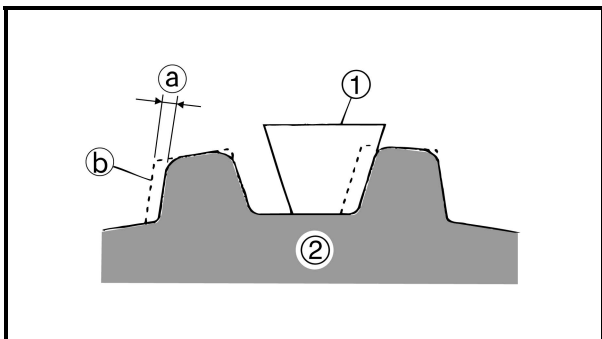
4. Check:
 - Crankshaft sprocket
 - Damage/wear → Replace the crankshaft.
 - Bearing
 - Cracks/damage/wear → Replace the crankshaft.
5. Check:
 - Crankshaft journal oil passage
 - Obstruction → Blow out with compressed air.



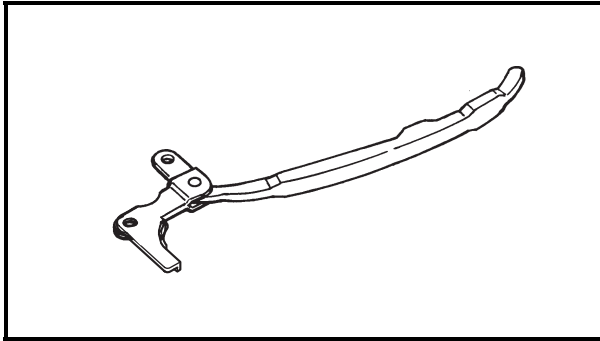
CHECKING THE TIMING CHAIN, CRANKSHAFT SPROCKET AND TIMING CHAIN GUIDE

The following procedure applies to all of the camshaft sprockets and timing chain guides.

1. Check:
 - Timing chain
 - Damage/stiffness → Replace the timing chain and camshaft sprocket and crankshaft sprocket as a set.
2. Check:
 - Crankshaft sprocket
 - More than 1/4 tooth wear (a) → Replace the timing chain and camshaft sprocket and crankshaft sprocket as a set.

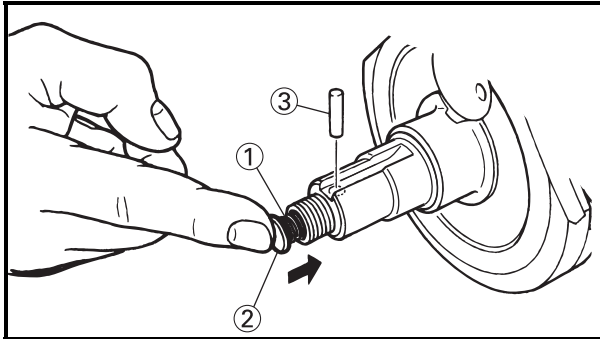


- (a) 1/4 tooth
- (b) Correct
- (1) Timing chain roller
- (2) Crankshaft sprocket



3. Check:

- Timing chain guide (intake side)
Damage/wear → Replace the timing chain guide (intake side)

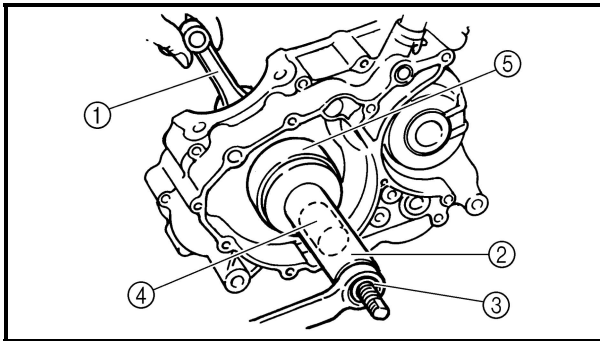


INSTALLING THE PLUNGER SEAL

1. Install:

- Compression spring ①
- Plunger seal ②
- Dowel pin ③

Check the plunger seal smooth operation pushing the plunger seal by your finger.



INSTALLING THE CRANKSHAFT ASSEMBLY

1. Install:

- Crankshaft assembly ①

NOTE:

Install the crankshaft assembly with the crankshaft installer pot ②, crankshaft installer bolt ③, adapter ④ and spacer ⑤.



Crankshaft installer pot
90890-01274

Installing pot
YU-90058

Crankshaft installer bolt
90890-01275

Bolt
YU-90060

Spacer
90890-01288

Adapter (M10)
90890-01383

Adapter #2
YU-90062

**CAUTION:**

To avoid scratching the crankshaft and to ease the installation procedure, lubricate the oil seal lips with lithium-soap-based grease and each bearing with engine oil.

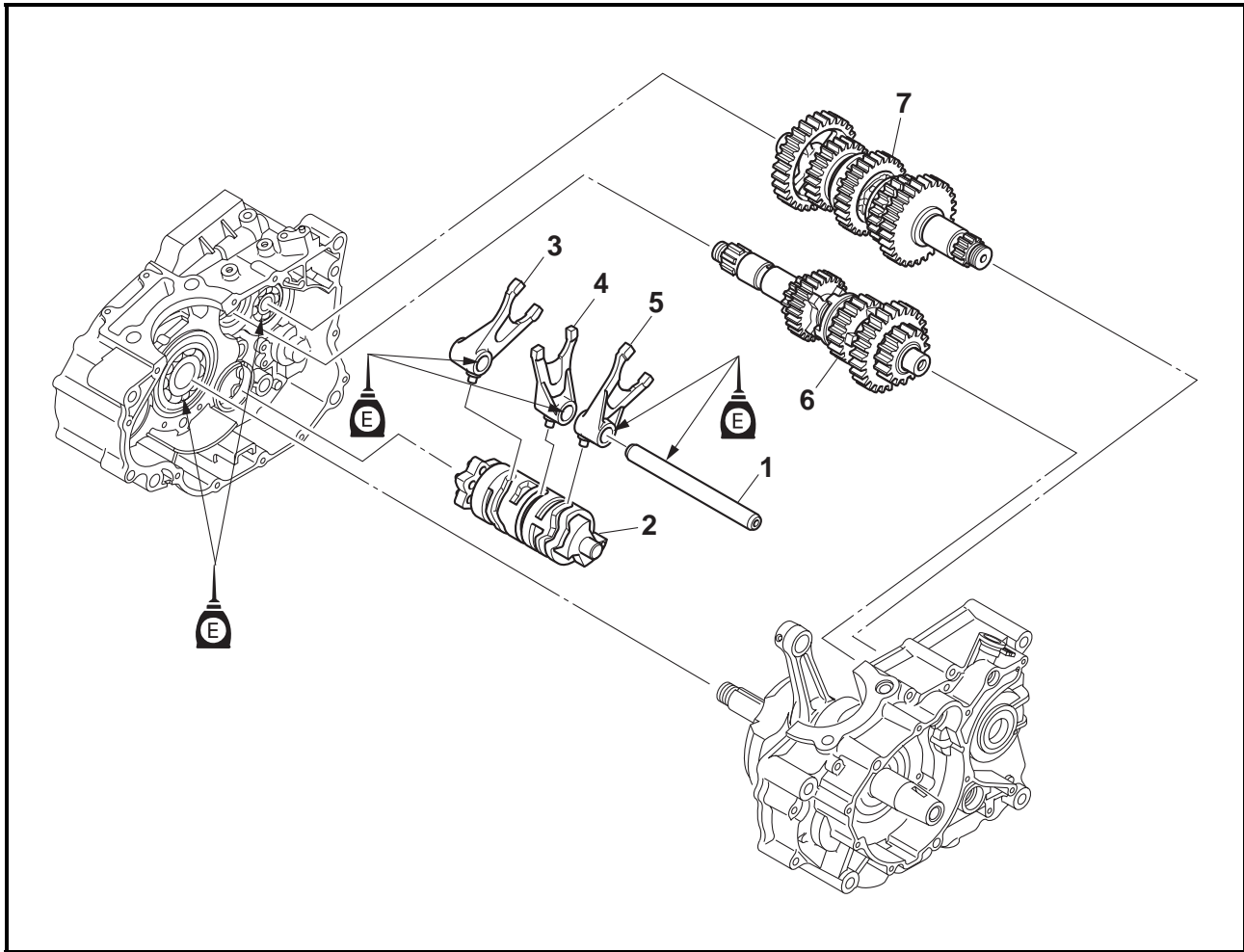
NOTE:

Hold the connecting rod at top dead center (TDC) with one hand while turning the nut of the crankshaft installer bolt with the other. Turn the crankshaft installer bolt until the crankshaft assembly bottoms against the bearing.

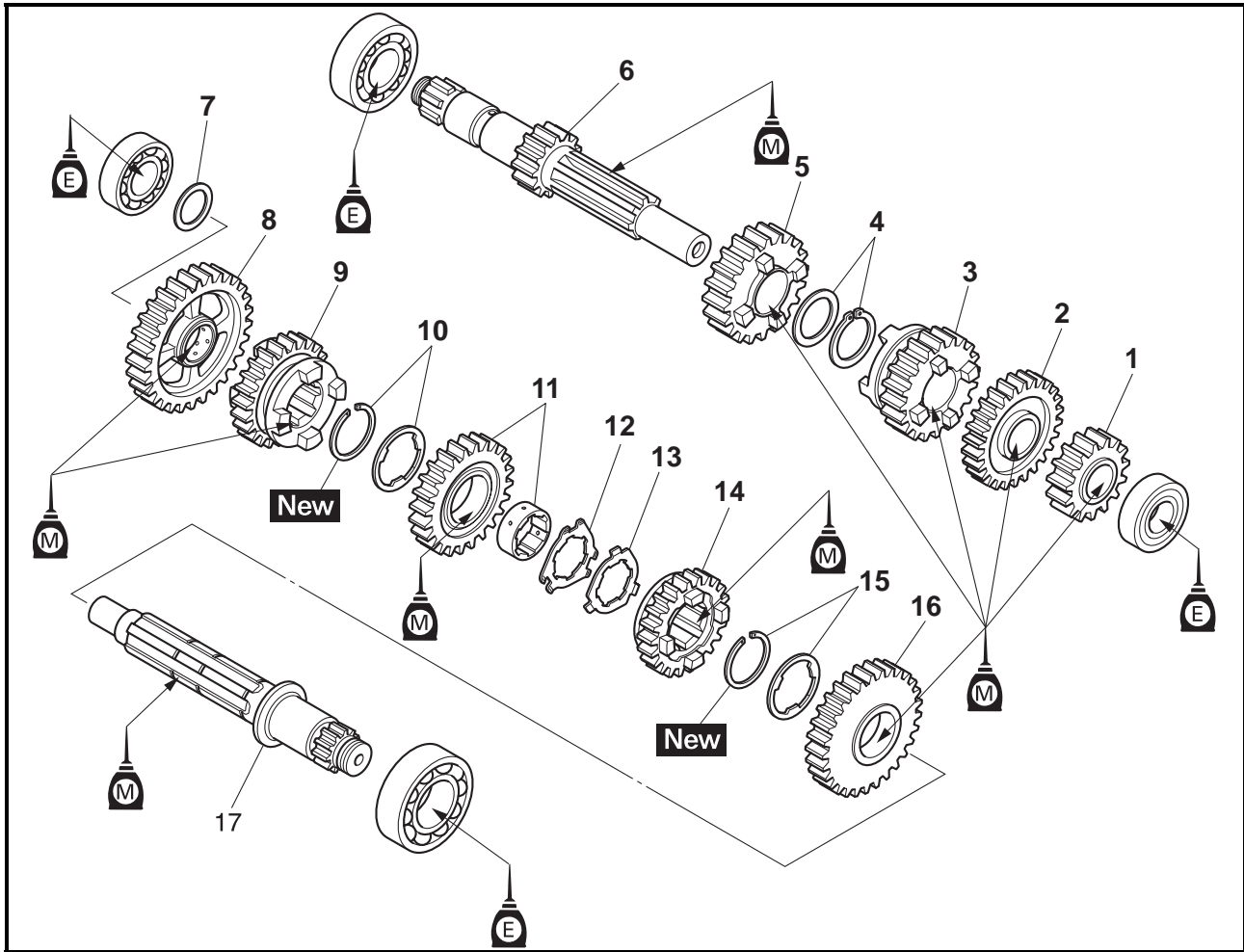
2. Install:
 - Balancer weight
To the right crank case.



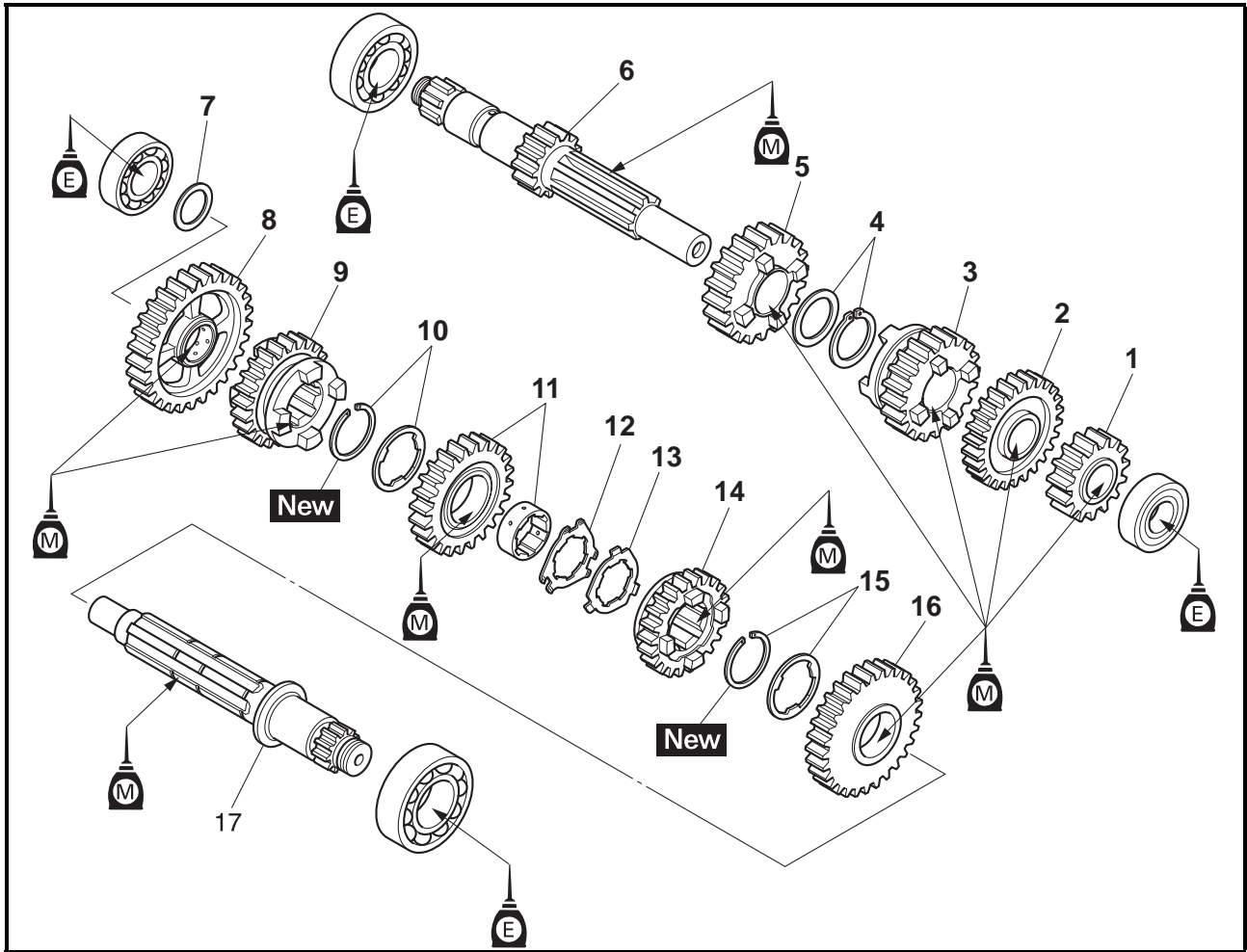
TRANSMISSION



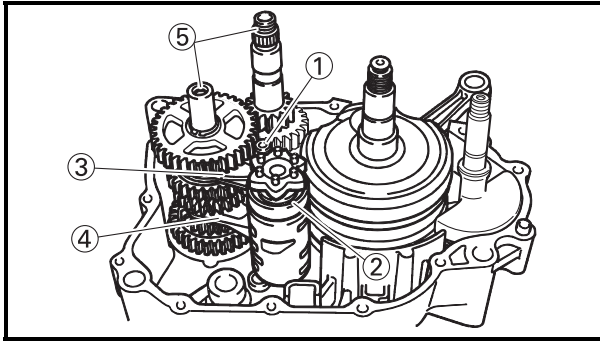
Order	Job/Parts to remove	Q'ty	Remarks
	Removing the transmission, shift drum assembly, and shift forks Crankcase		Remove the parts in the order listed. Separate. Refer to "CRANKCASE".
1	Shift fork guide bar	1	
2	Shift drum assembly	1	
3	Shift fork-3 (R)	1	
4	Shift fork-2 (C)	1	
5	Shift fork-1 (L)	1	
6	Main axle assembly	1	
7	Drive axle assembly	1	
			For installation, reverse the removal procedure.



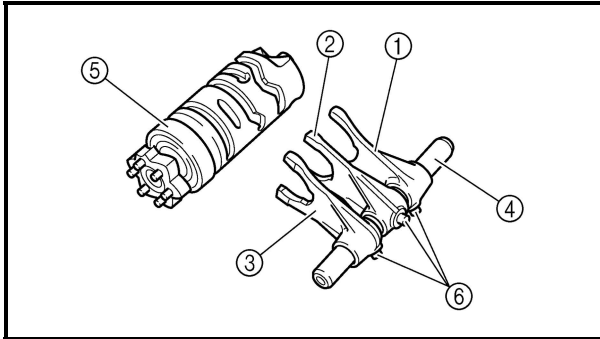
Order	Job/Parts to remove	Q'ty	Remarks
	Disassembling the transmission		Remove the parts in the order listed.
1	2nd pinion gear	1	
2	5th pinion gear	1	
3	3rd pinion gear	1	
4	Circlip/washer	1/1	
5	4th pinion gear	1	
6	Main axle	1	
7	Plain washer	1	
8	1st wheel gear	1	
9	4th wheel gear	1	
10	Circlip/washer	1/1	
11	3rd wheel gear/collar	1/1	
12	Claw washer 1	1	
13	Claw washer 2	1	
14	5th wheel gear	1	
15	Circlip/washer	1/1	
16	2nd wheel gear	1	



Order	Job/Parts to remove	Q'ty	Remarks
17	Drive axle	1	For installation, reverse the removal procedure.

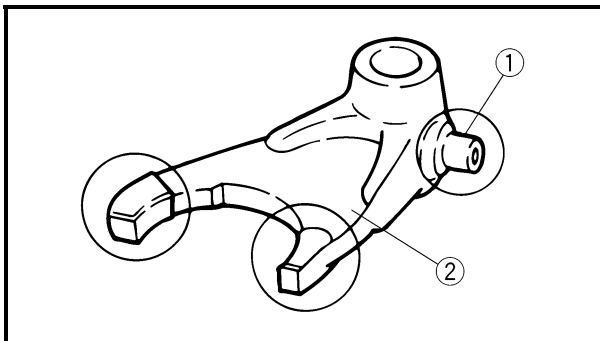
**REMOVING THE TRANSMISSION**

1. Remove:
 - Shift fork guide bar ①
 - Shift drum assembly ②
 - Shift fork 3 (R) ③
 - Shift fork 2 (C) ④
 - Shift fork 1 (L) ⑤
2. Remove:
 - Transmission ⑥

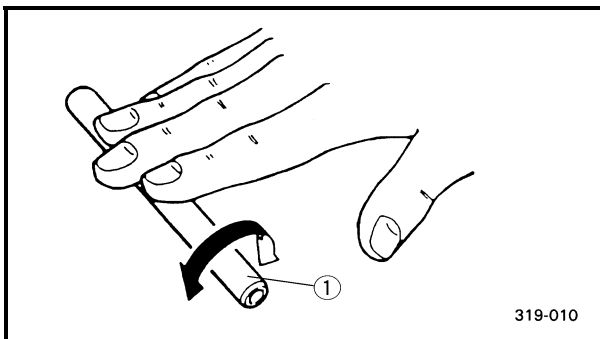
**CHECKING THE SHIFT FORKS**

The following procedure applies to all of the shift forks.

1. Check:
 - Shift fork movement
(along the shift fork guide bar)
Rough movement → Replace the shift forks and shift fork guide bar as a set.
- ① Shift fork 3 (R)
 ② Shift fork 2 (C)
 ③ Shift fork 1 (L)
 ④ Shift fork guide bar
 ⑤ Shift drum assembly
 ⑥ Shift fork cam follower



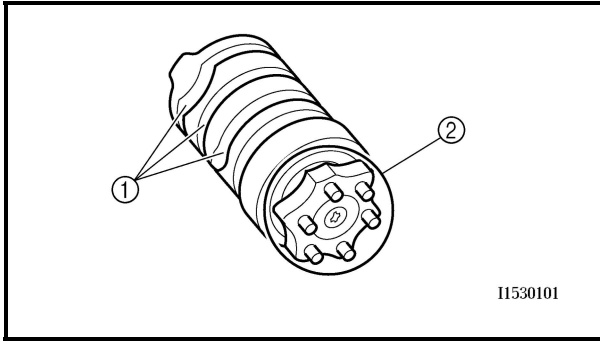
2. Check:
 - Shift fork cam follower ①
 - Shift fork pawl ②
Bends/damage/scoring/wear → Replace the shift fork.



3. Check:
 - Shift fork guide bar ①
Roll the shift fork guide bar on a flat surface.
Bends → Replace.

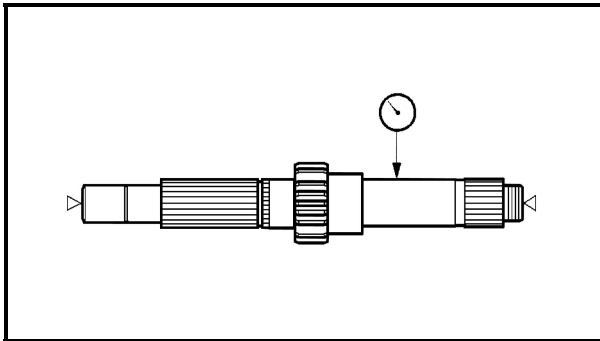
⚠ WARNING

Do not attempt to straighten a bent shift fork guide bar.



CHECKING THE SHIFT DRUM ASSEMBLY

1. Check:
 - Shift drum groove ①
Damage/scratches/wear → Replace the shift drum assembly.
 - Shift drum segment ②
Damage/wear → Replace the shift drum assembly.
 - Shift drum bearing
Damage/pitting → Replace the shift drum assembly.

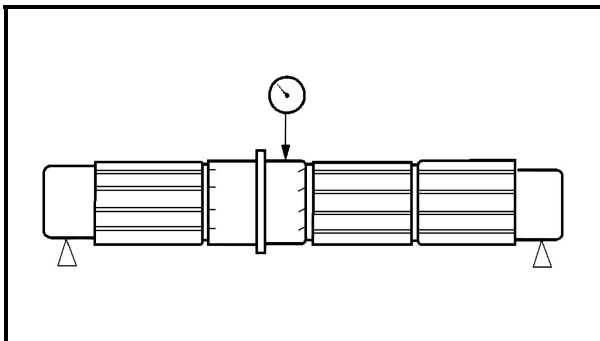


CHECKING THE TRANSMISSION

1. Measure:
 - Main axle runout
(with a centering device and dial gauge)
Out of specification → Replace the main axle.



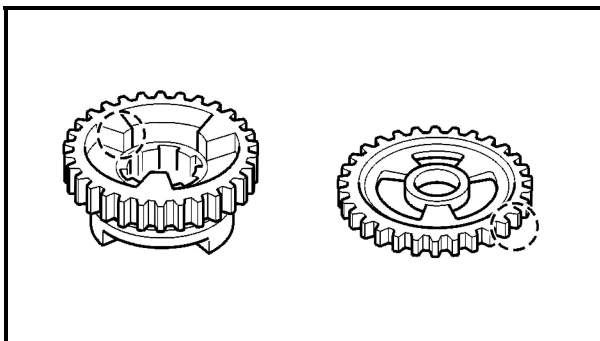
**Main axle runout limit
0.06 mm (0.0024 in)**



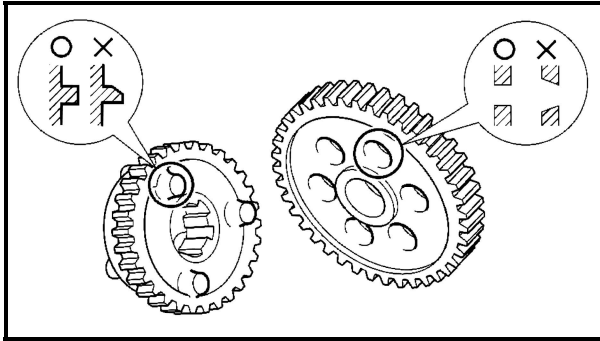
2. Measure:
 - Drive axle runout
(with a centering device and dial gauge)
Out of specification → Replace the drive axle.



**Drive axle runout limit
0.06 mm (0.0024 in)**



3. Check:
 - Transmission gears
Blue discoloration/pitting/wear → Replace the defective gear(s).
 - Transmission gear dogs
Cracks/damage/rounded edges → Replace the defective gear(s).

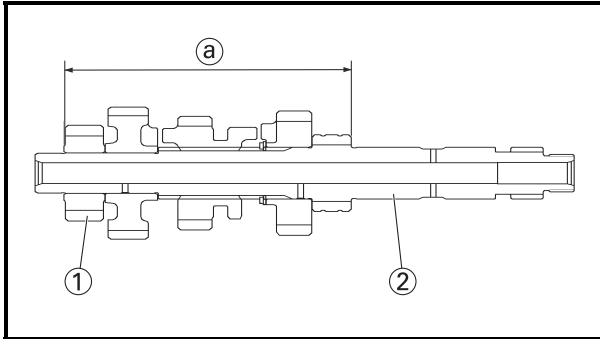


4. Check:

- Transmission gear engagement (each pinion gear to its respective wheel gear)
Incorrect → Reassemble the transmission axle assemblies.

NOTE: _____

When reassembling the main axle, press the 2nd pinion gear ① onto it ② as shown.



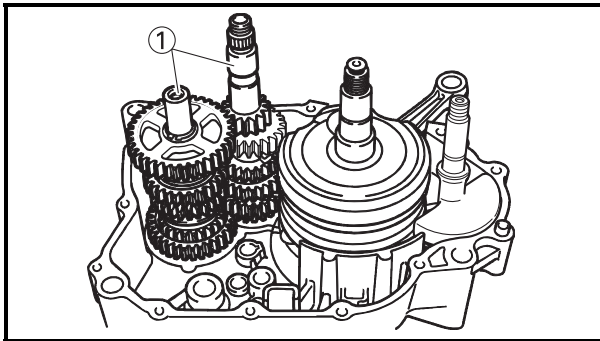
① 102.2 ~ 102.4 mm (4.02 ~ 4.03 in)

5. Check:

- Transmission gear movement
Rough movement → Replace the defective part(s).

6. Check:

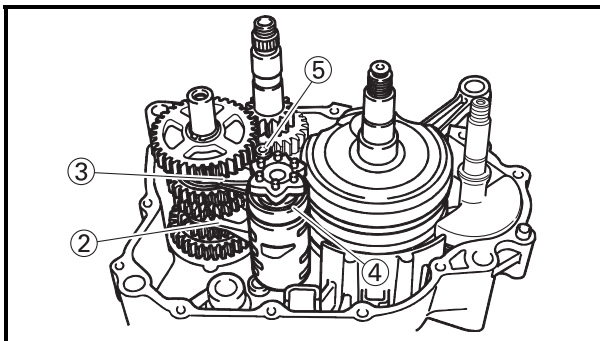
- Circlips
Bends/damage/looseness → Replace.



INSTALLING THE SHIFT FORKS AND SHIFT DRUM ASSEMBLY

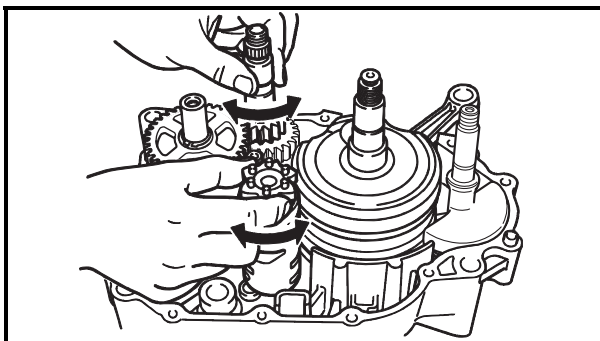
1. Install:

- Transmission ①
- Shift fork 1 (L) ②
- Shift fork 2 (C)
- Shift fork 3 (R) ③
- Shift drum assembly ④
- Shift fork guide bar ⑤
- Spacer
- Right crankcase



NOTE: _____

- The embossed marks on the shift forks should face towards the left side of the engine and be in the following sequence: "L", "C", "R".
- The grooved side of the shift fork guide bar should face towards the right side of the engine.



2. Check:

- Shift cam operation
Unsmoothy operation → Repair.

NOTE: _____

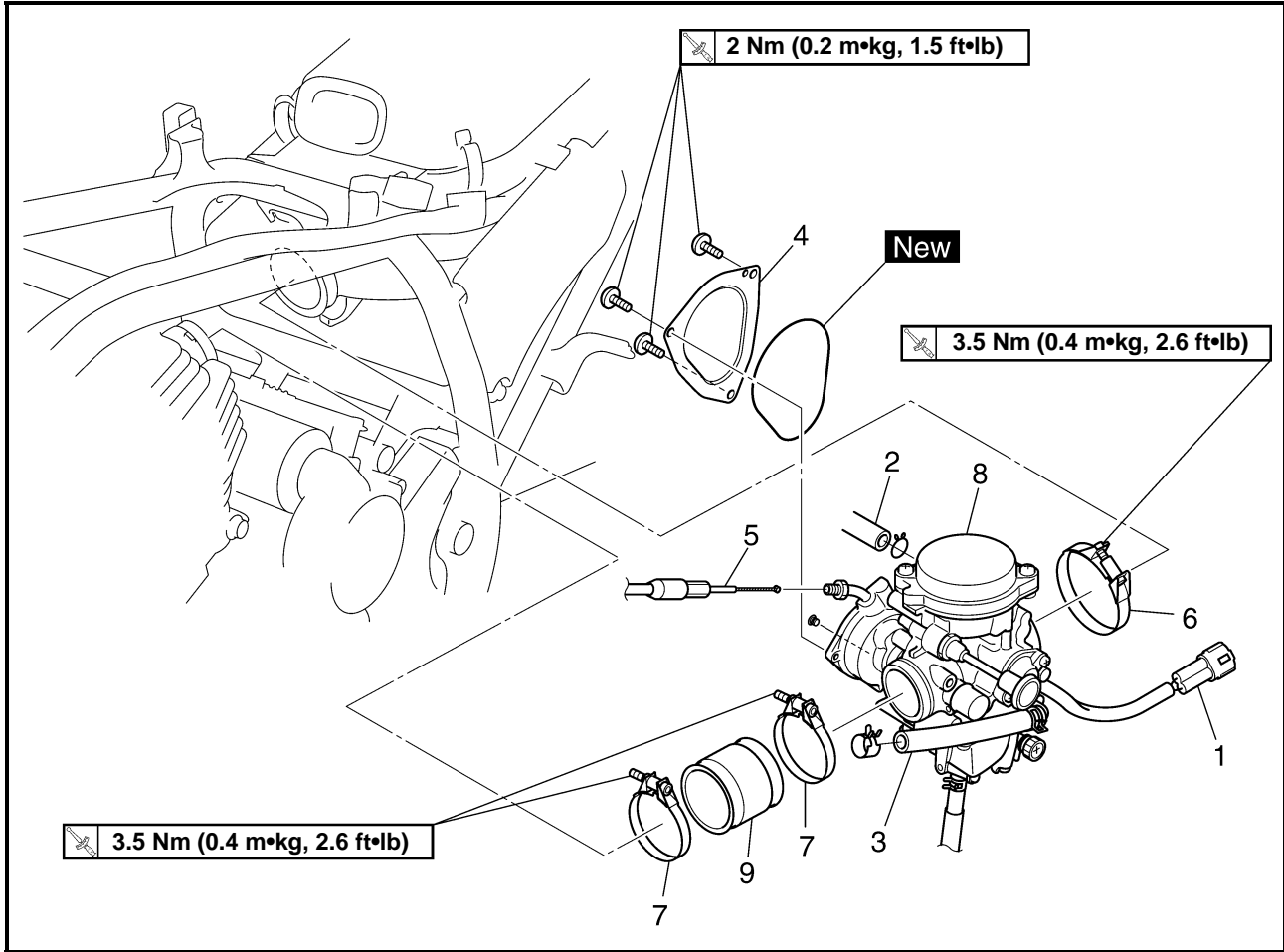
Check the transmission and shift forks for smooth operation by turning the shift cam with your hand.



EBS00141

CARBURETOR

CARBURETOR

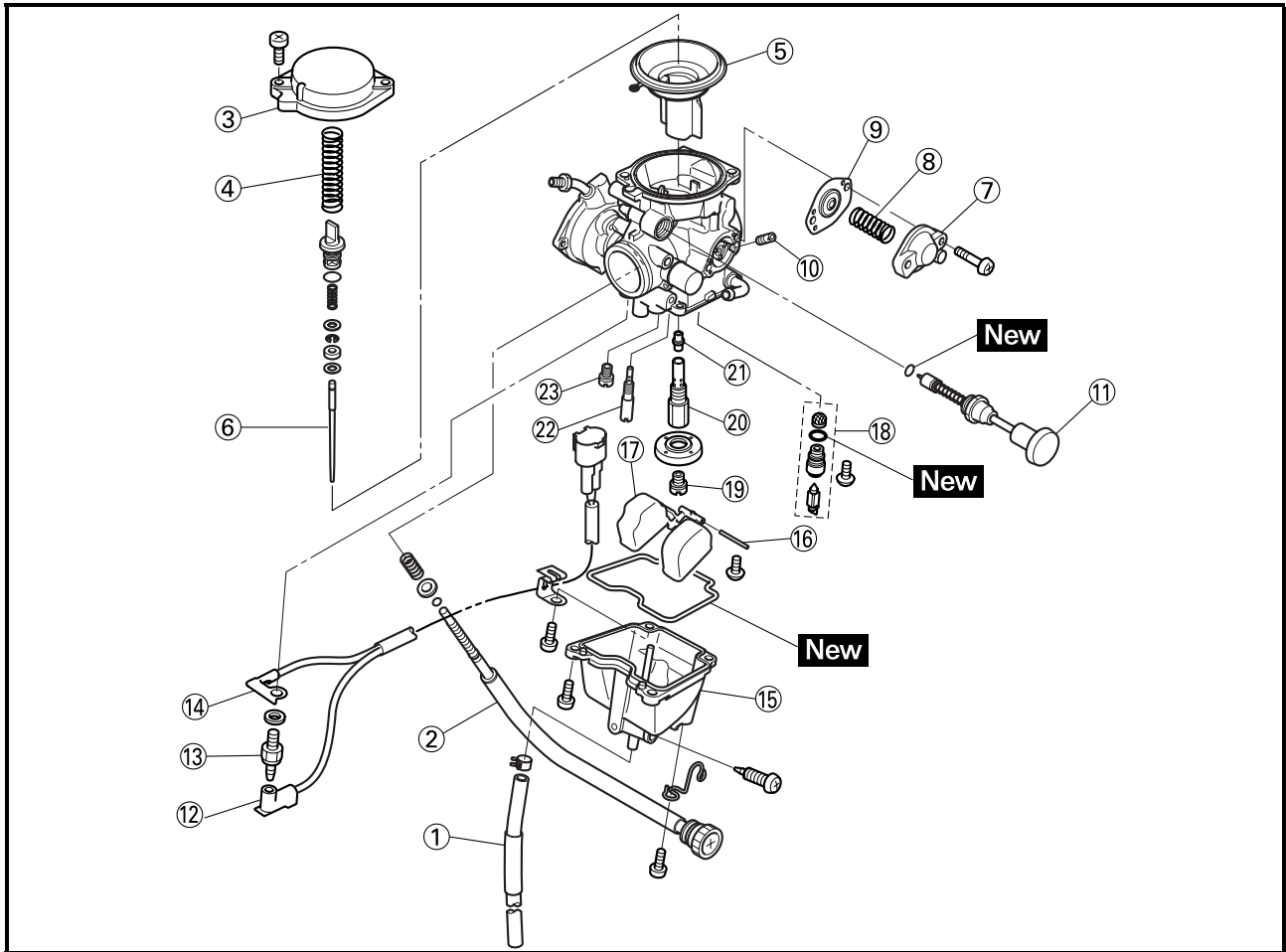


5

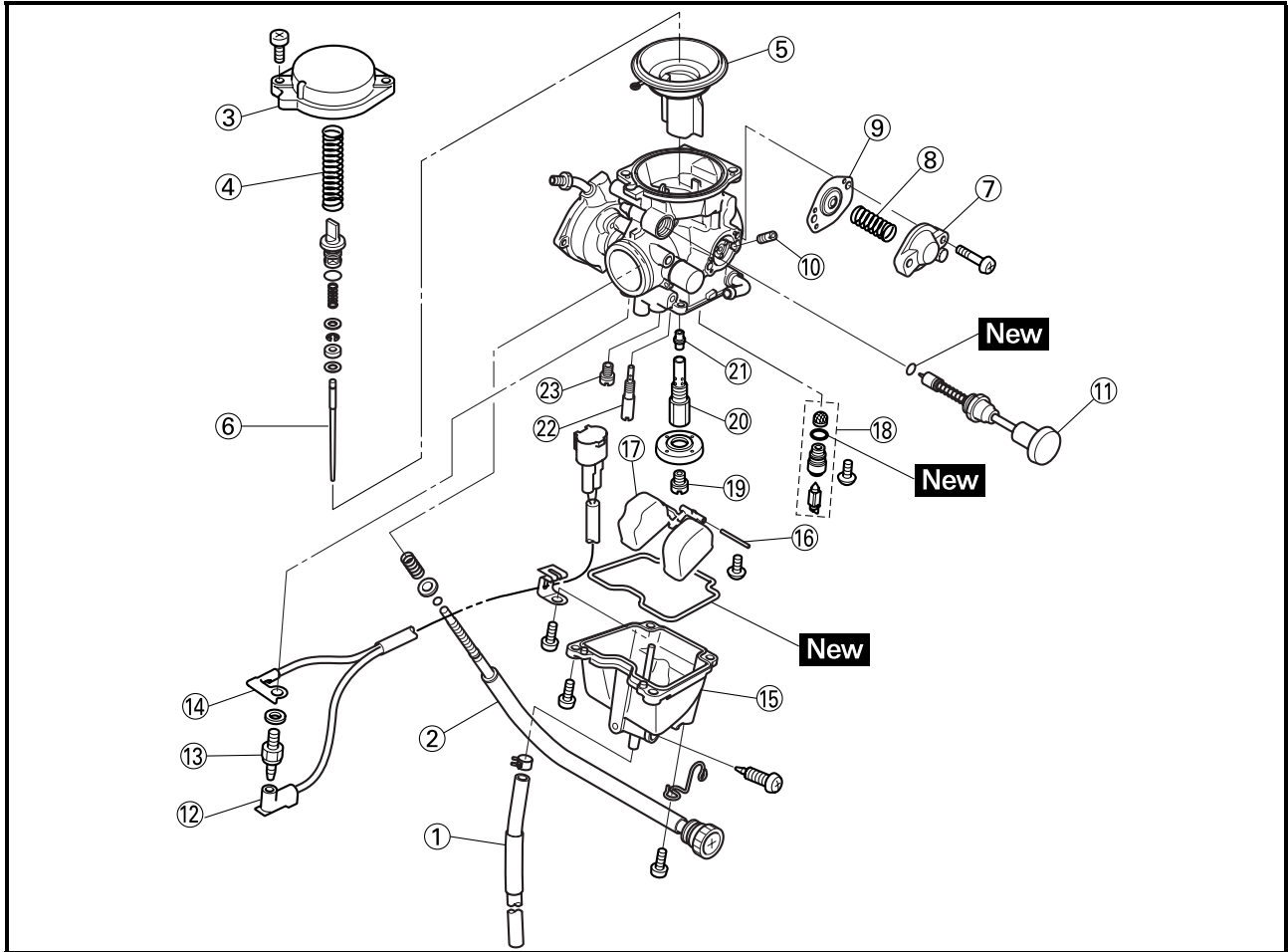
Order	Job/Part	Q'ty	Remarks
	Removing a carburetor		
	Seat/front fender/rear fender/air filter case		Remove the parts in the order listed. Refer to "SEAT, FENDERS AND FUEL TANK" in chapter 3.
1	Carburetor warmer coupler	1	Disconnect.
2	Air vent hose	1	Disconnect.
3	Fuel hose (carburetor side)	1	
4	Throttle cable cover	1	
5	Throttle cable	1	
6	Clamp	1	Loosen.
7	Clamp	2	Loosen.
8	Carburetor	1] Refer to "INSTALLING THE CARBURETOR JOINT" and "INSTALLING THE CARBURETOR".
9	Carburetor joint	1	
			For installation, reverse the removal procedure.



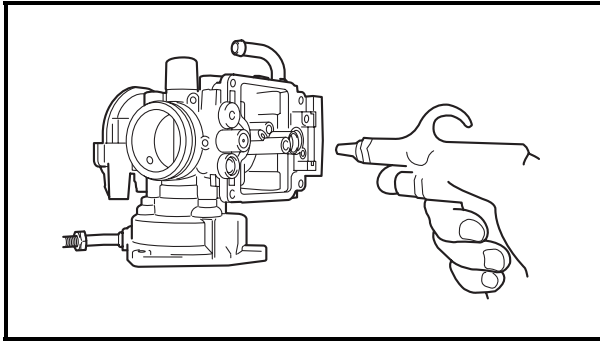
EBS00144



Order	Job/Part	Q'ty	Remarks
	Disassembling the carburetor		Remove the parts in the order listed.
①	Drain hose	1	
②	Throttle stop screw	1	
③	Cover	1	
④	Diaphragm spring	1	
⑤	Piston valve	1	
⑥	Jet needle	1	
⑦	Cover	1	
⑧	Spring	1	
⑨	Coasting enricher diaphragm	1	
⑩	Coasting enricher jet (P. A. J. 2)	1	
⑪	Starter plunger	1	
⑫	Carburetor warmer positive lead	1	
⑬	Carburetor warmer	1	
⑭	Carburetor warmer negative lead	1	
⑮	Float chamber	1	
⑯	Float pin	1	



Order	Job/Part	Q'ty	Remarks
⑰	Float	1	
⑱	Needle valve seat set	1	
⑲	Main jet	1	
⑳	Needle jet holder	1	
㉑	Needle jet	1	
㉒	Pilot jet	1	
㉓	Starter jet	1	
			For assembly, reverse the disassembly procedure.



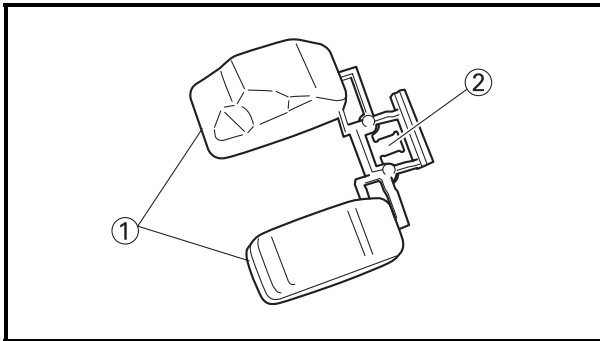
EBS00148

CHECKING THE CARBURETOR

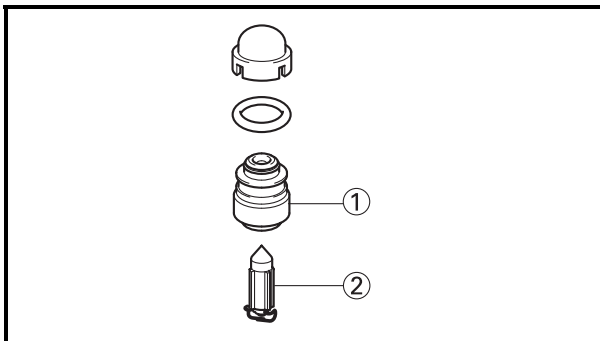
1. Check:
 - carburetor body
Cracks/damage → Replace.
 - float chamber
Contamination → Clean as indicated.
 - fuel passage
Contamination → Clean.



- a. Wash the carburetor in a petroleum based solvent. Do not use any caustic carburetor cleaning solution.
- b. Blow out all of the passages and jets with compressed air.

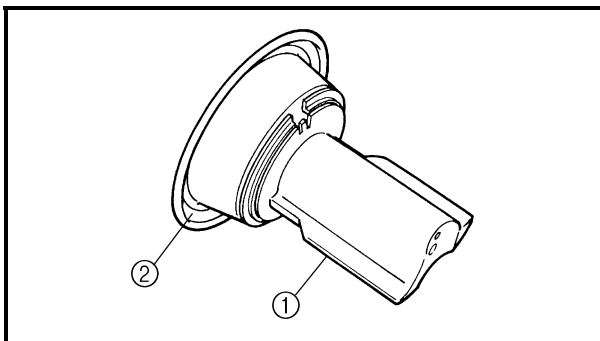


2. Check:
 - float ①
 - float tang ②
Damage → Replace.

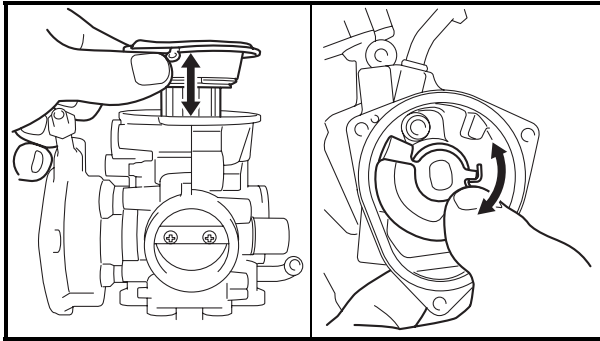


3. Check:
 - valve seat ①
 - needle valve ②
Contamination → Clean.
Wear/damage → Replace as a set.

NOTE: _____
Always replace the valve seat, needle valve and O-ring as a set.

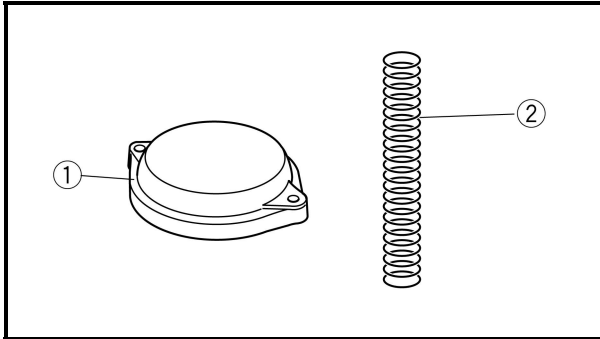


4. Check:
 - piston valve ①
Scratches/wear/damage → Replace.
 - piston valve diaphragm ②
Cracks/tears → Replace.

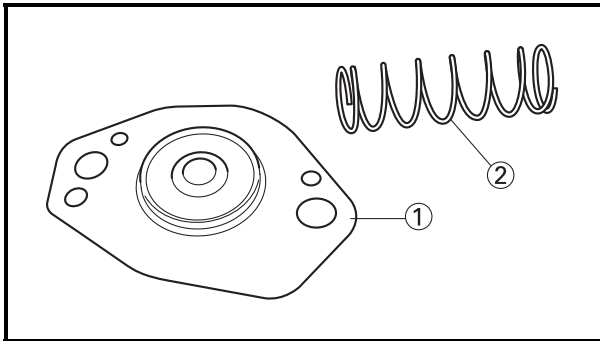


5. Check:
- piston valve movement
Sticks → Replace.
Insert the piston valve into the carburetor body, and check for free movement.

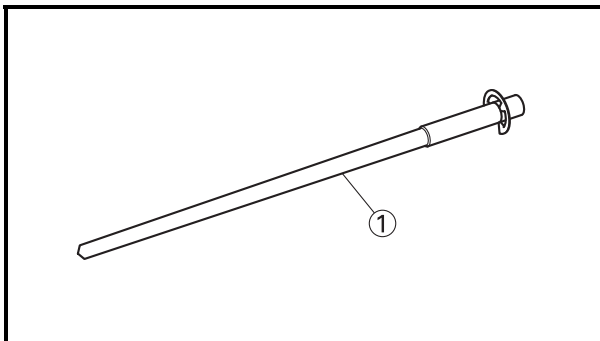
6. Check:
- throttle valve movement
Sticks → Replace.



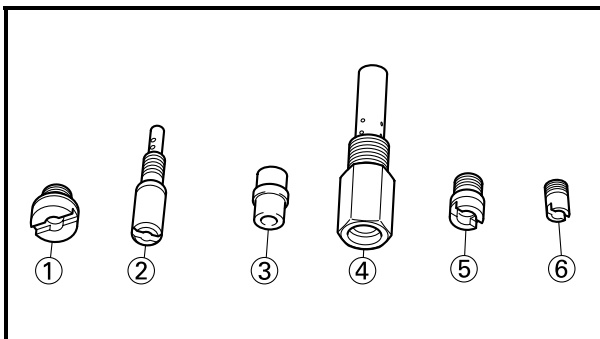
7. Check:
- cover ①
 - diaphragm spring ②
Cracks/damage → Replace.



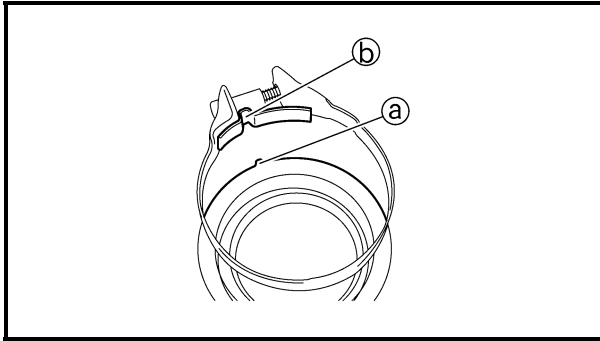
8. Check:
- coasting enricher diaphragm ①
 - spring ②
Cracks/damage → Replace.



9. Check:
- jet needle ①
Bends/wear/damage → Replace.
 - clip groove
Free play/wear → Replace.



10. Check:
- main jet ①
 - pilot jet ②
 - needle jet ③
 - needle jet holder ④
 - starter jet ⑤
 - coasting enricher jet (P. A. J. 2) ⑥
Bends/wear/damage → Replace.
Blockage → Blow out the jets with compressed air.

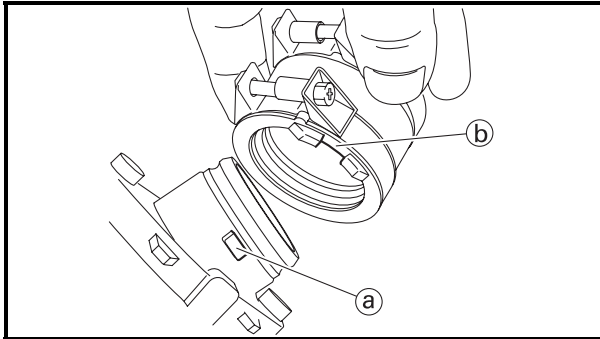


INSTALLING THE CARBURETOR JOINT

1. Install:
 - clamp

NOTE: _____

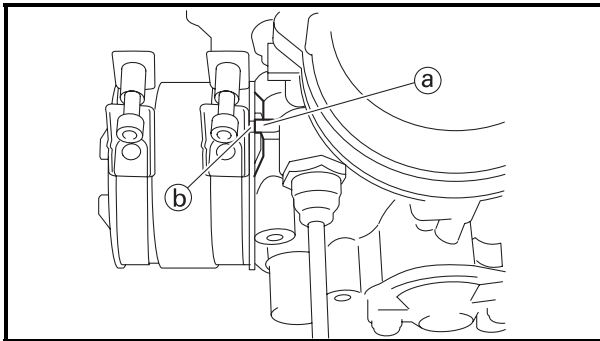
Align the projection (a) on the carburetor joint with the slot (b) in the clamp.



2. Install:
 - carburetor joint

NOTE: _____

Align the projection (a) on the cylinder head with the slot (b) in the carburetor joint.



INSTALLING THE CARBURETOR

1. Install:
 - carburetor

NOTE: _____

Align the projection (a) on the carburetor with the slot (b) in the carburetor joint.

2. Install:
 - throttle cable
 - throttle cable cover

3. Adjust:
 - throttle lever free play

Refer to “ADJUSTING THE THROTTLE LEVER FREE PLAY” in chapter 3.

4. Adjust:
 - engine idling speed

Refer to “ADJUSTING THE ENGINE IDLING SPEED” in chapter 3.

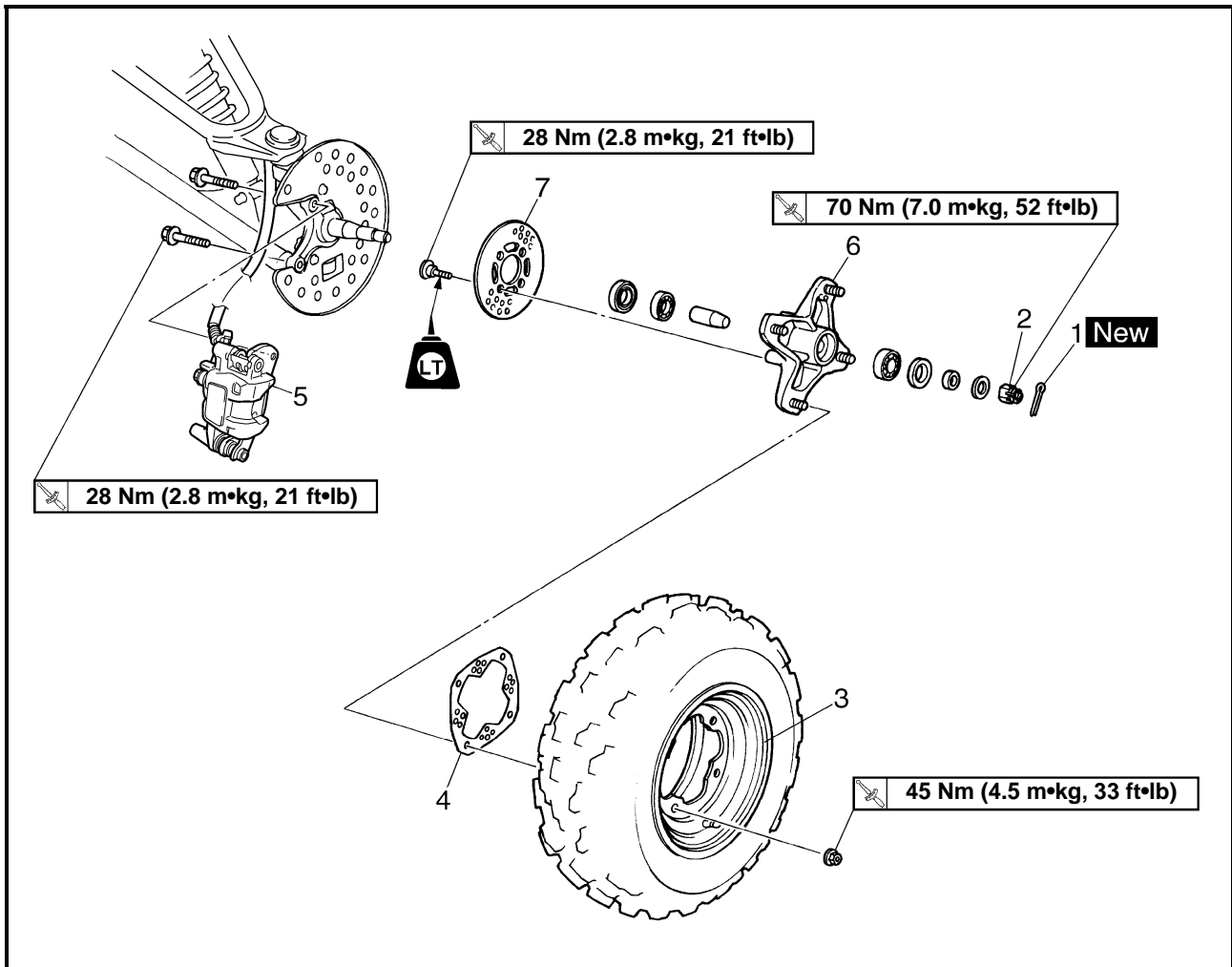


EBS00378

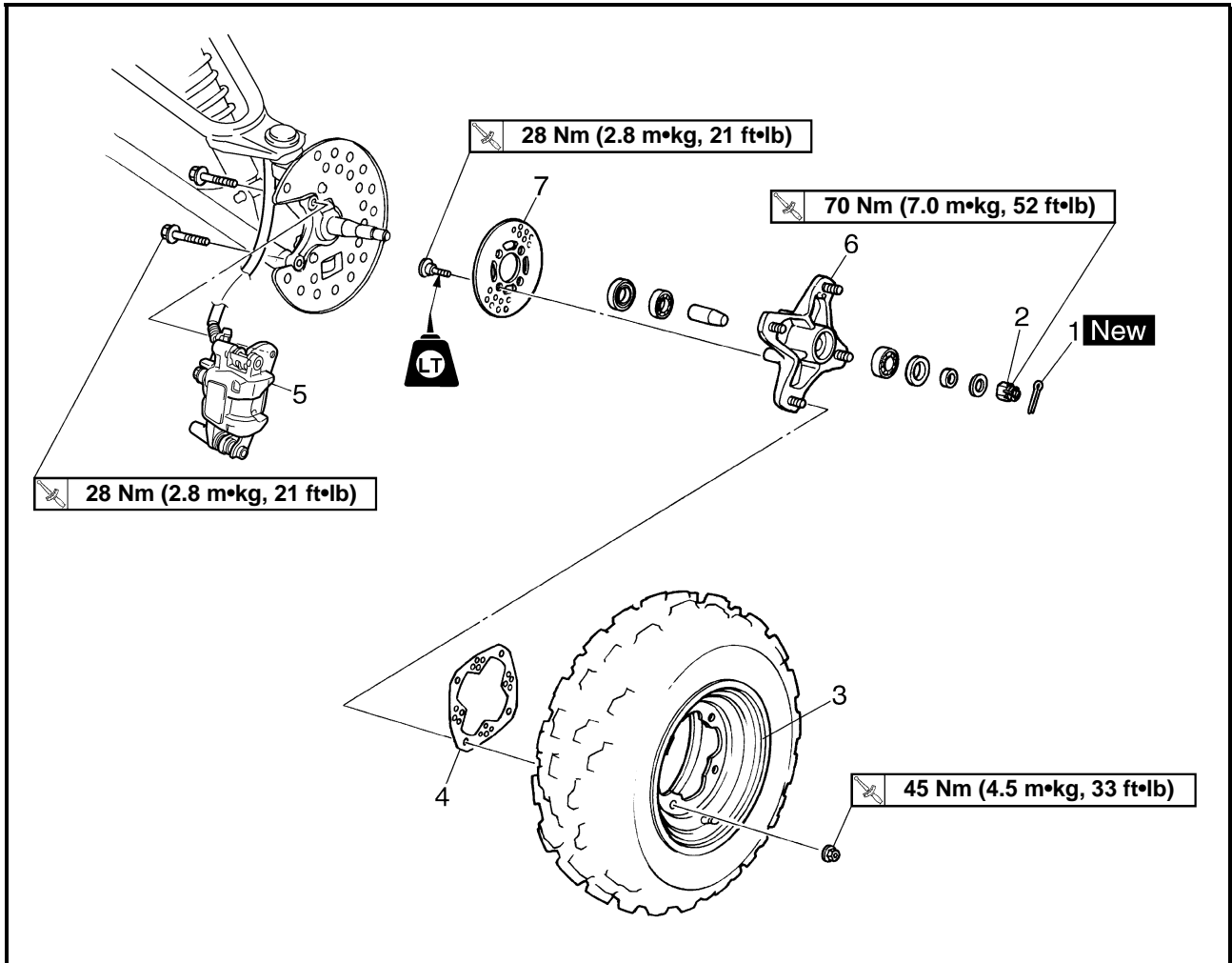
CHASSIS

FRONT AND REAR WHEELS

FRONT WHEELS



Order	Job/Part	Q'ty	Remarks
	Removing the front wheels		Remove the parts in the order listed. The following procedure applies to both of the front wheels. Place the machine on a level surface. ⚠ WARNING _____ Securely support the machine so there is no danger of it falling over. _____
1	Cotter pin	1] Refer to "INSTALLING THE WHEEL HUBS".
2	Axle nut	1	
3	Front wheel	1] Refer to "INSTALLING THE FRONT WHEELS".
4	Brake disc guard (outer)	1	

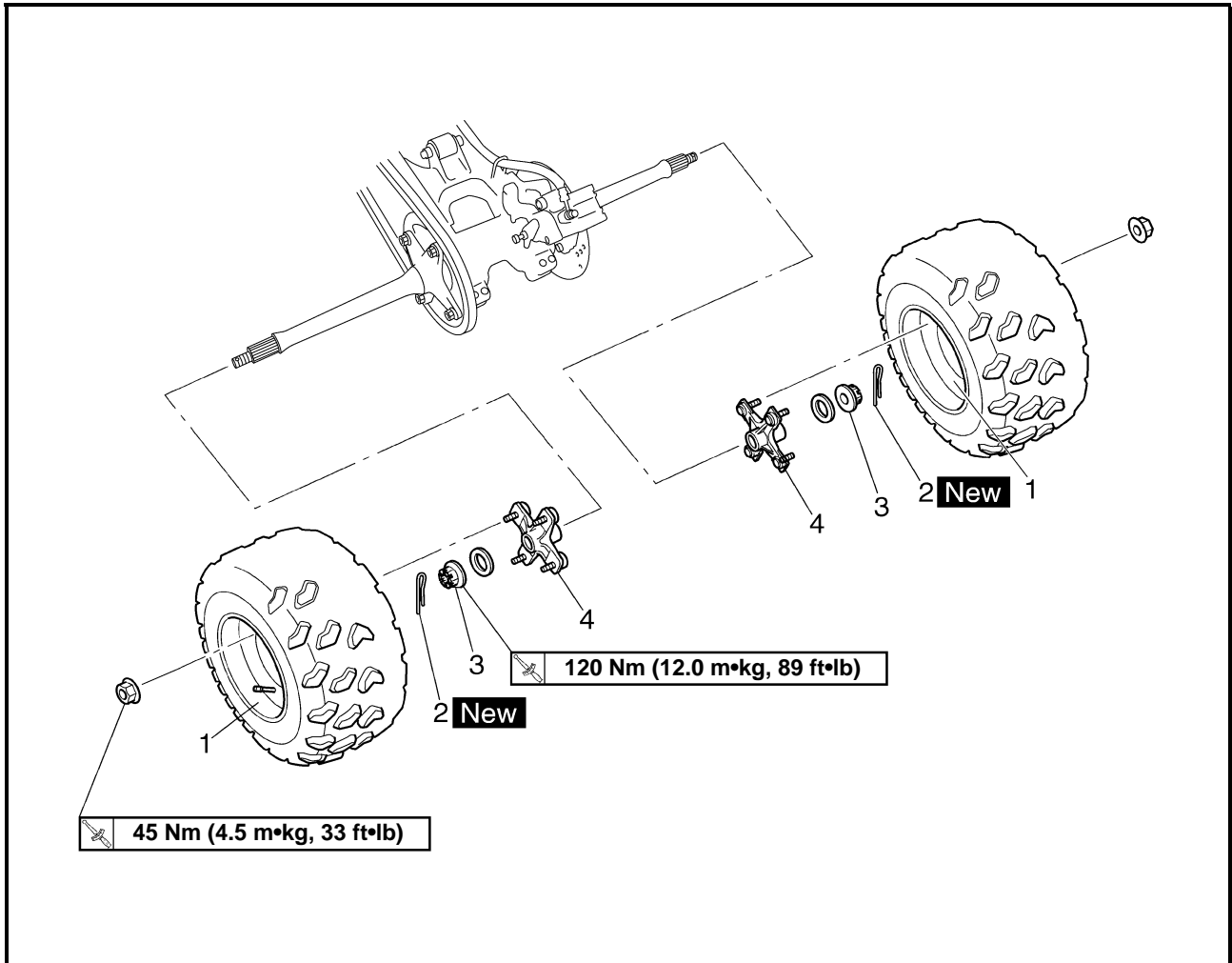


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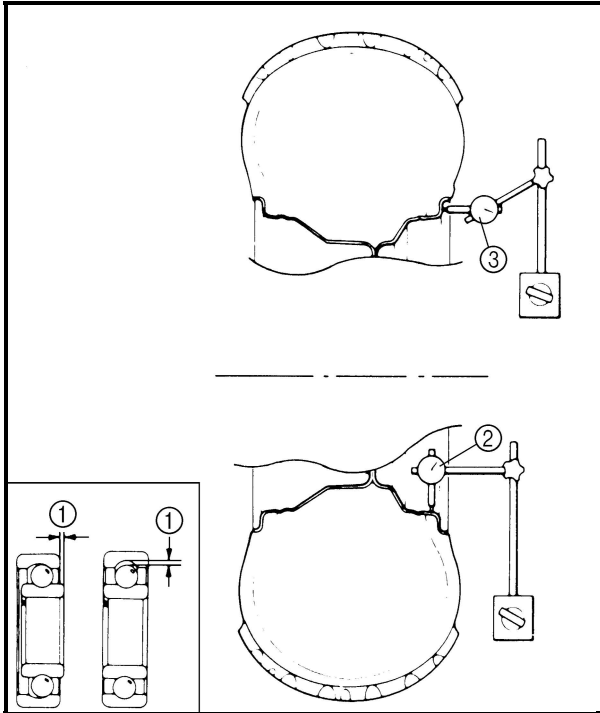
Order	Job/Part	Q'ty	Remarks
5	Brake caliper assembly	1	NOTE: Do not squeeze the brake lever when the brake caliper is off of the brake discs as the brake pads will be forced shut.
6	Wheel hub	1	Refer to "INSTALLING THE WHEEL HUB BEARINGS".
7	Brake disc	1	Rear to "INSTALLING FRONT BRAKE DISCS". For installation, reverse the removal procedure.



REAR WHEELS



Order	Job/Part	Q'ty	Remarks
	Removing the rear wheels		Remove the parts in the order listed. Place the machine on a level surface. ⚠ WARNING _____ Securely support the machine so there is no danger of it falling over.
1	Rear wheel	2	Refer to "INSTALLING THE WHEEL HUBS". For installation, reverse the removal procedure.
2	Cotter pin	2	
3	Axle nut	2	
4	Wheel hub	2	



EBS00383

CHECKING THE WHEELS

1. Check:
 - wheels
2. Measure:
 - wheel runout
 Over the specified limit → Replace the wheel or check the wheel bearing play ①.



Wheel runout limit

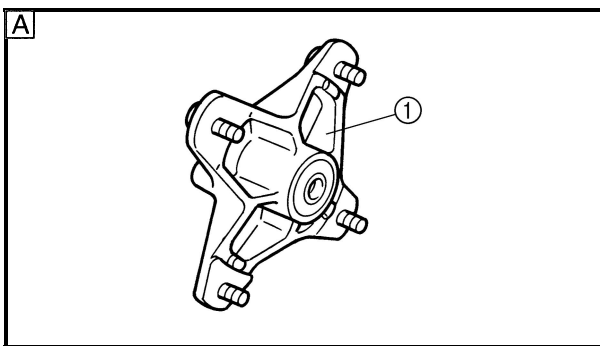
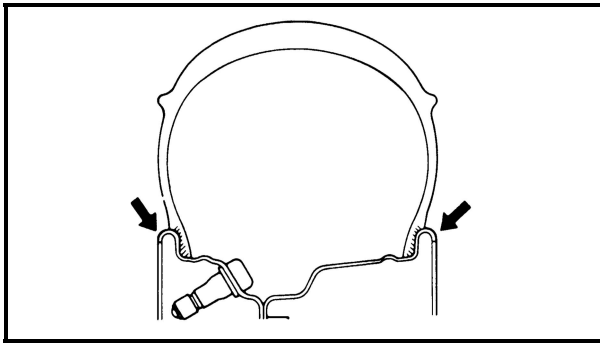
Radial ②: 2.0 mm (0.08 in)

Lateral ③: 2.0 mm (0.08 in)

3. Check:
 - wheel balance
 Out of balance → Adjust.

⚠ WARNING

After replacing the tire, ride conservatively to allow the tire to be properly seated in the rim. Failure to do so may cause an accident resulting in machine damage and possible operator injury.

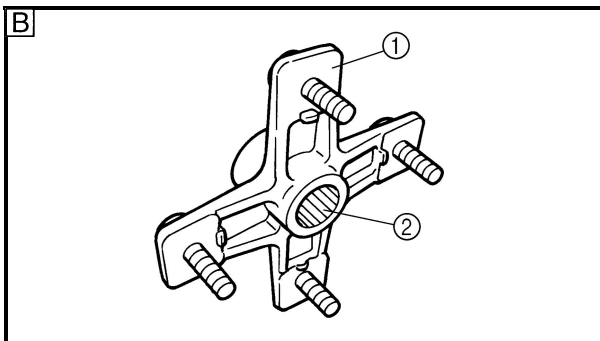


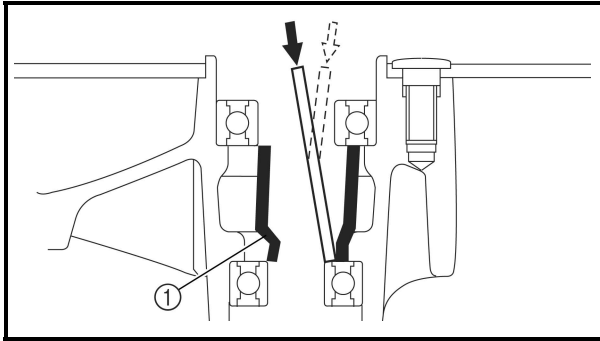
EBS00385

CHECKING THE WHEEL HUBS

1. Check:
 - wheel hubs ①
 Cracks/damage → Replace.
 - splines (wheel hub) ②
 Wear/damage → Replace the wheel hub.

- A** Front
- B** Rear





2. Check:
 - wheel bearings
Wheel hub play/wheel turns roughly → Replace.



- a. Clean wheel hub exterior.
- b. Drive bearing out by pushing spacer aside and tapping around perimeter of bearing inner race. Use soft metal drift punch and hammer. The spacer ① “floats” between bearings. Remove both bearings as described.

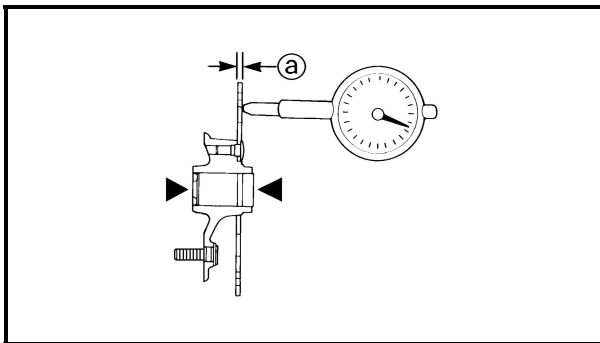
⚠ WARNING

Eye protection is recommended when using striking tools.

- c. To install the wheel bearings, reverse the above sequence. Use a socket that matches outside diameter of bearing outer race to drive in bearing.

CAUTION:

Do not strike the center race or balls of the bearing. Contact should be made only with the outer race.



EBS00389

CHECKING THE BRAKE DISCS

1. Check:
 - brake discs
Galling/damage → Replace.
2. Measure:
 - brake disc deflection
Out of specification → Replace.

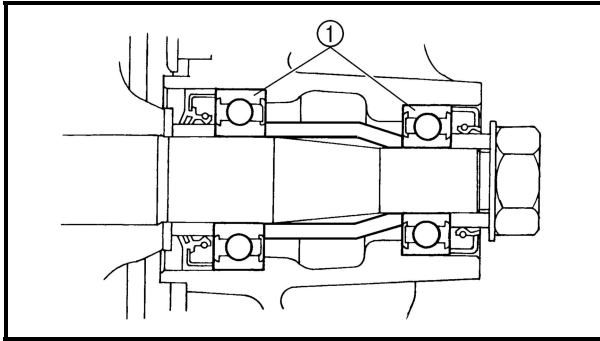


Brake disc maximum deflection
Front: 0.15 mm (0.006 in)
Rear: 0.15 mm (0.006 in)

- brake disc thickness ①
Out of specification → Replace.



Brake disc minimum thickness
Front: 3 mm (0.12 in)
Rear: 3.5 mm (0.14 in)

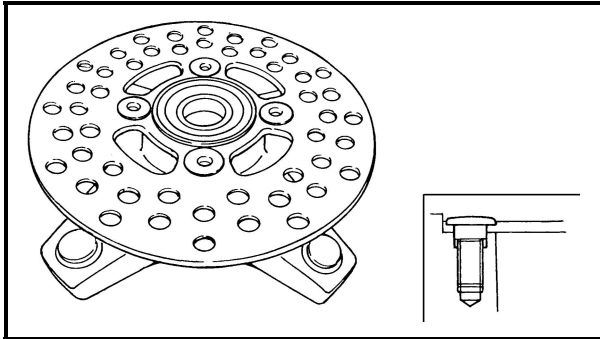


INSTALLING THE FRONT WHEEL HUB BEARINGS

1. Install:
 - bearings ①

NOTE: _____

Face the oil seal side of the bearing inward.

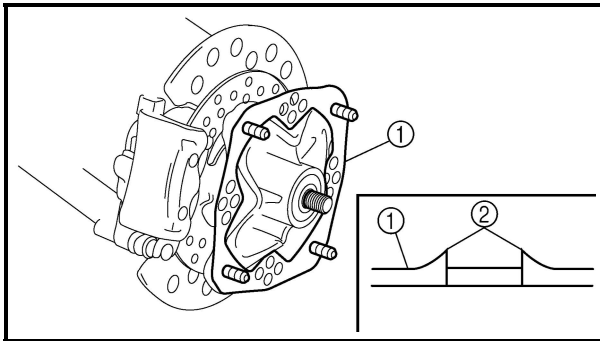


INSTALLING THE FRONT BRAKE DISCS

1. Install:
 - brake discs

NOTE: _____

Install the brake disc with its spot-faced side facing the bolt heads.



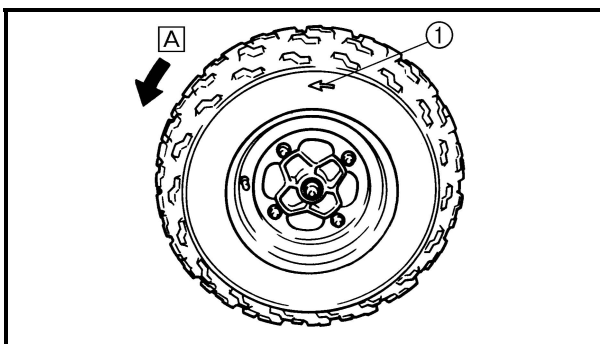
EBS00392

INSTALLING THE FRONT WHEELS

1. Install:
 - brake disc guards (outer) ①

NOTE: _____

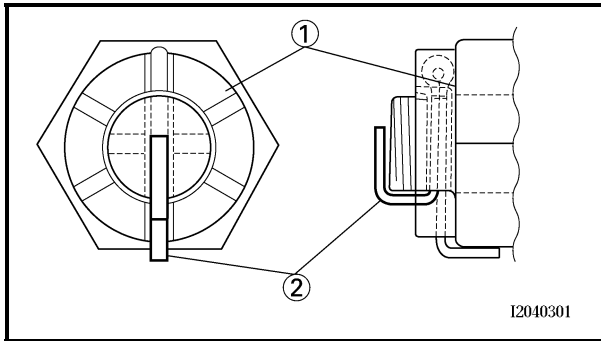
Install the brake disc guard (outer) with punched burrs ② on the wheel hub side.



2. Install:
 - wheels

NOTE: _____

The arrow mark ① on the must point in the direction of rotation **A** of the wheel.



EBS00390

INSTALLING THE WHEEL HUBS

1. Install:

- front axle nuts ①



Front axle nut
70 Nm (7.0 m•kg, 52 ft•lb)

- rear axle nuts ①



Rear axle nut
120 Nm (12.0 m•kg, 89 ft•lb)

- cotter pins ② **New**

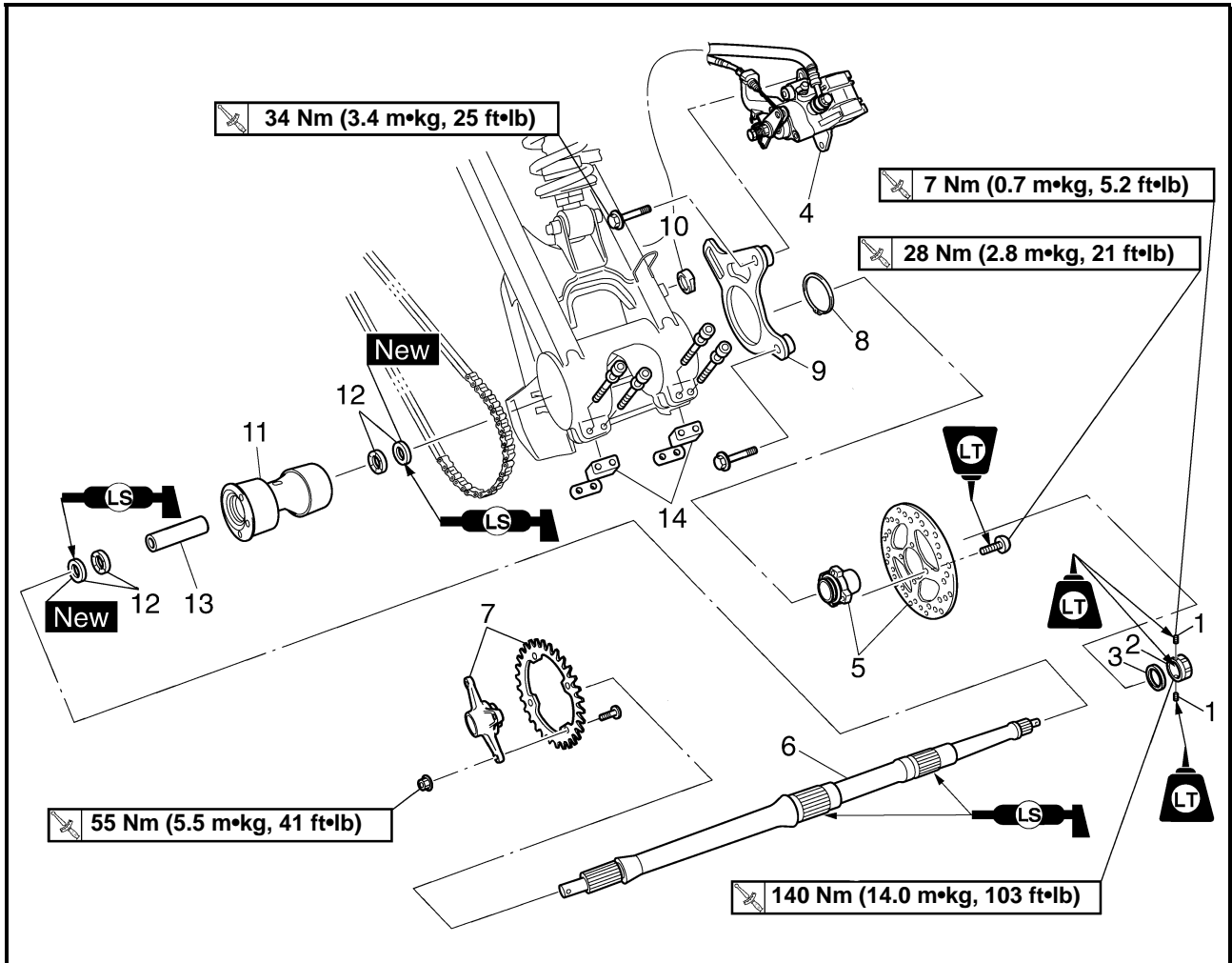
NOTE:

- Do not loosen the axle nut after torquing it. If the axle nut groove is not aligned with the cotter pin hole, align the groove with the hole by tightening the axle nut.
- Bend the longer cotter pin up.

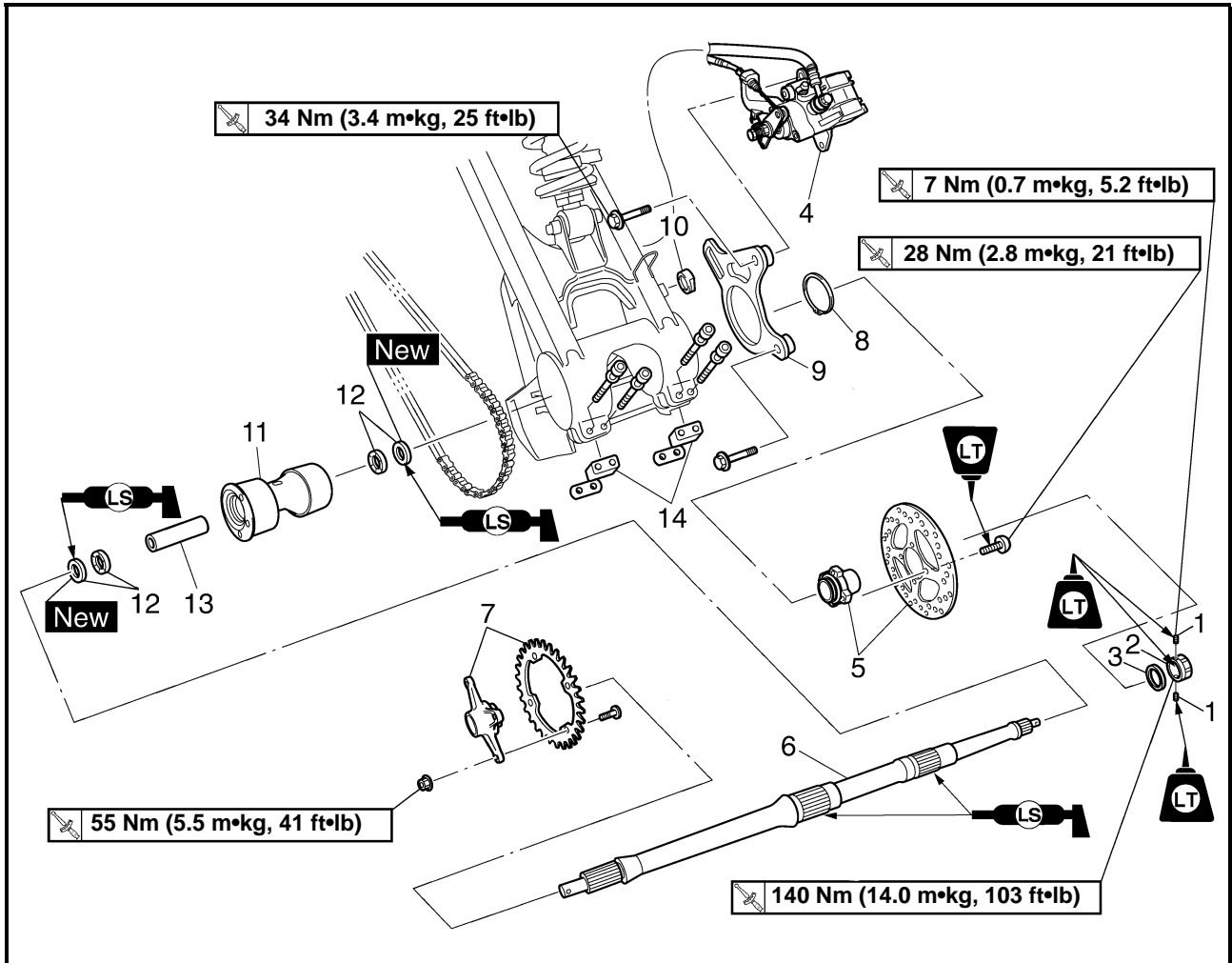


EBS00382

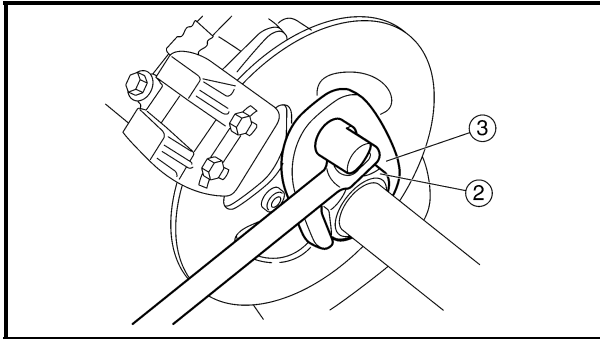
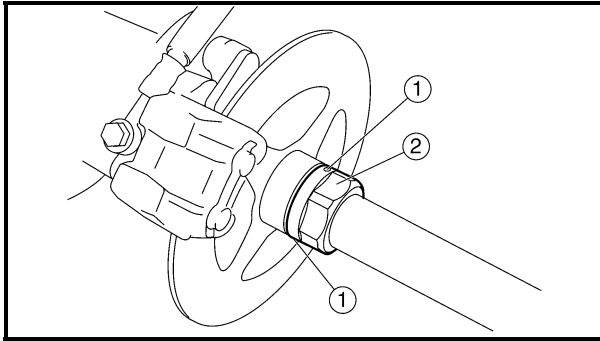
REAR AXLE AND REAR AXLE HUB



Order	Job/Part	Q'ty	Remarks
	Removing the rear axle and rear axle hub		Remove the parts in the order listed.
	Rear wheels/rear wheel hubs		Refer to "FRONT AND REAR WHEELS".
1	Bolt	2	Refer to "REMOVING THE REAR AXLE" and "INSTALLING THE REAR AXLE".
2	Nut	1	
3	Conical spring washer	1	
4	Brake caliper	1	
			NOTE: _____ Do not apply the brake pedal and do not use the parking brake when the brake caliper is off of the brake disc as the brake pad will be force shut.



Order	Job/Part	Q'ty	Remarks
5	Brake disc/brake disc bracket	1/1	
6	Rear axle	1	Refer to "REMOVING THE REAR AXLE".
7	Driven sprocket/sprocket bracket	1/1	Refer to "INSTALLING THE DRIVEN SPROCKET".
8	Circlip	1	
9	Brake caliper bracket	1	
10	Collar	1	
11	Rear axle hub	1	
12	Bearing/oil seal	2/2	
13	Spacer	1	
14	Dust cover	1	
			For installation, reverse the removal procedure.



EBS00393

REMOVING THE REAR AXLE

1. Place the machine on a level surface.
2. Loosen:
 - bolts ①
3. Remove:
 - nut ②

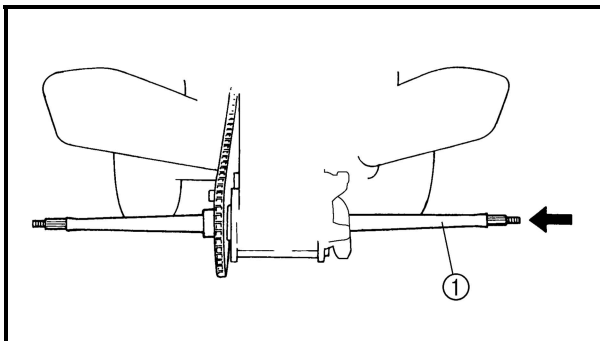
NOTE: _____

- Apply the brake pedal so that the rear axle does not turn, when loosening the nut.
- Use the PTT wrench 46 or axle nut wrench (46 mm) ③.



PTT wrench 46
90890-06588
Axle nut wrench (46 mm)
YM-37134

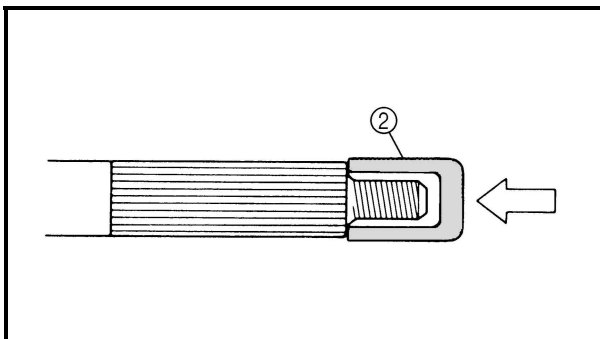
4. Elevate the rear wheels by placing the suitable stand under the frame.
5. Remove:
 - rear wheels
 - wheel hubs
 - nuts
 - washers

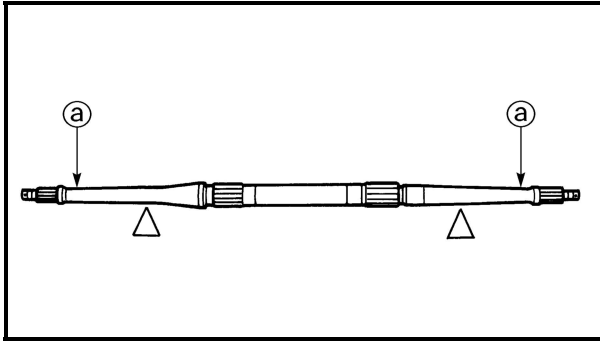


6. Remove:
 - rear axle ①

CAUTION: _____

- Never directly tap the axle end with a hammer, since this will result in damage to the axle thread and spline.
- Attach a suitable socket ② on the axle end and tap it with a soft hammer, then pull out the rear axle to the right.





EBS00395

CHECKING THE REAR AXLE

- Check:
 - rear axle runout (a)
Out of specification → Replace.

⚠ WARNING

Do not attempt to straighten a bent axle.



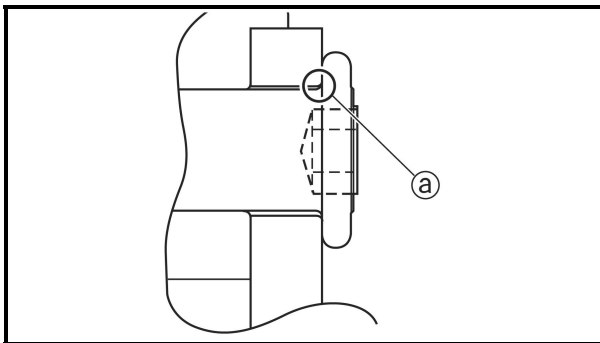
Rear axle runout limit
1.5 mm (0.06 in)

CHECKING THE DRIVEN SPROCKET

- Check:
 - driven sprocket
Refer to "REAR SHOCK ABSORBER, SWINGARM AND DRIVE CHAIN".

CHECKING THE BRAKE DISC

- Check:
 - brake disc
Refer to "FRONT AND REAR WHEELS".

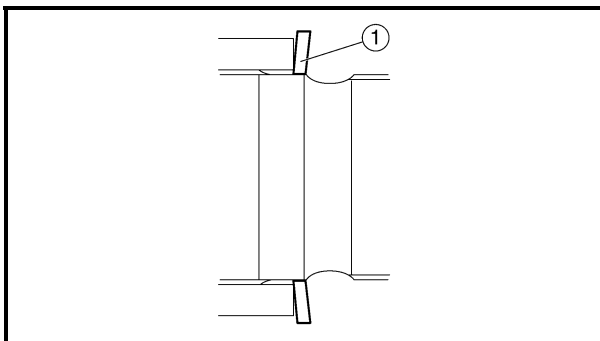


INSTALLING THE DRIVEN SPROCKET

- Install:
 - driven sprocket

NOTE:

Make sure that the blunt-edged corner (a) of the driven sprocket is facing outward.



EBS00397

INSTALLING THE REAR AXLE

- Install:
 - conical spring washer (1)

NOTE:

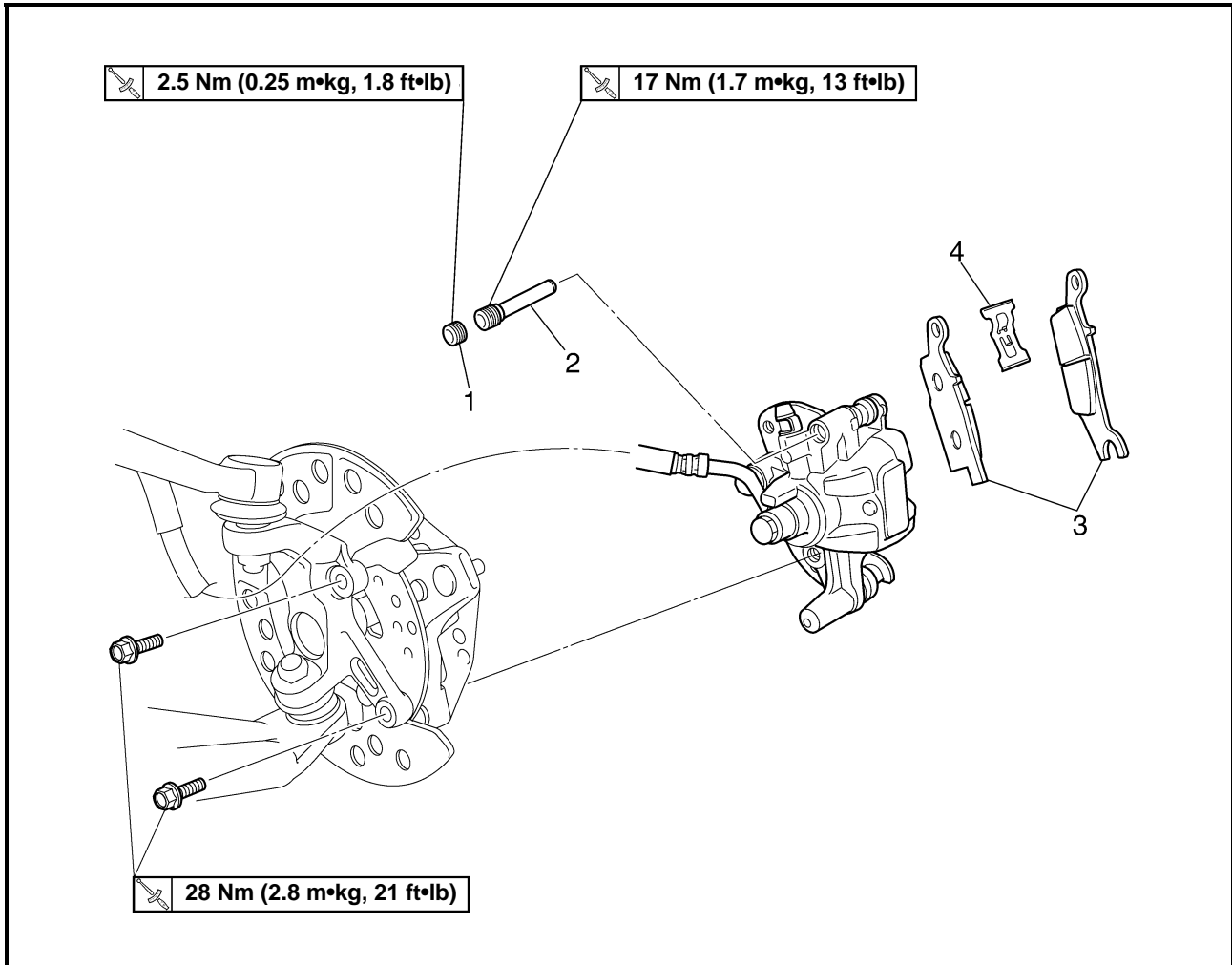
Install the conical spring washer with the convex side of the washer facing inward as shown.



EBS00400

FRONT AND REAR BRAKES

FRONT BRAKE PADS

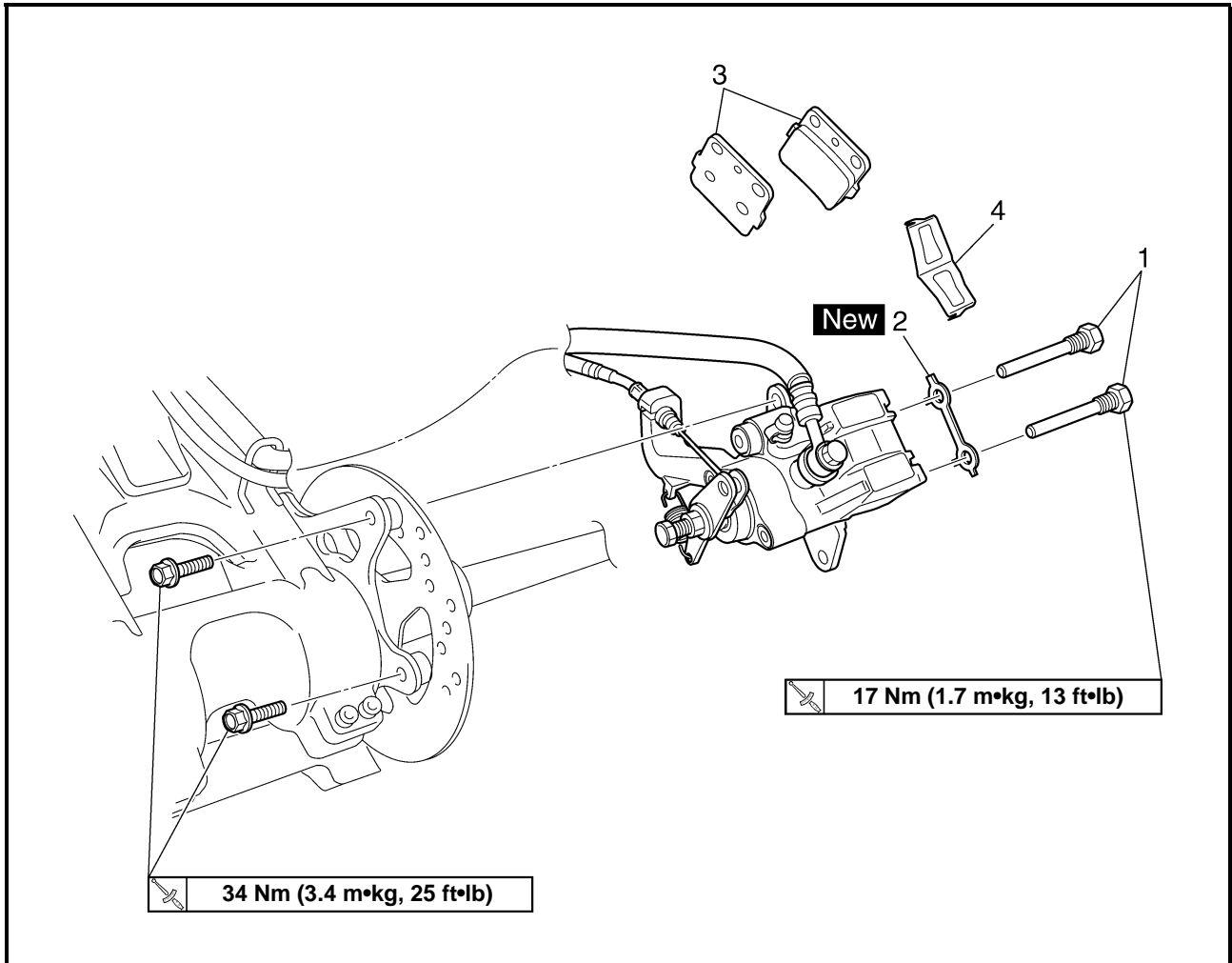


Order	Job/Part	Q'ty	Remarks
	Removing the front brake pads		Remove the parts in the order listed. The following procedure applies to both of the front brake calipers. Refer to "FRONT AND REAR WHEELS".
1	Front wheel	1	Refer to "REPLACING THE FRONT BRAKE PADS".
1	Bolt	1	
2	Brake pad retaining bolt	2	
3	Brake pad	1	
4	Brake pad spring		For installation, reverse the removal procedure.



EBS00401

REAR BRAKE PADS



Order	Job/Part	Q'ty	Remarks
	Removing the rear brake pads		Remove the parts in the order listed.
1	Brake pad retaining bolt	2	Refer to "REPLACING THE REAR BRAKE PADS". For installation, reverse the removal procedure.
2	Lock washer	1	
3	Brake pad	2	
4	Brake pad spring	1	



EBS00402

CAUTION: _____

Disc brake components rarely require disassembly.

DO NOT:

- disassemble components unless absolutely necessary;
- use solvents on internal brake components;
- use spent brake fluid for cleaning; (use only clean brake fluid)
- allow brake fluid to come in contact with the eyes, as this may cause eye injury;
- splash brake fluid onto painted surfaces or plastic parts, as this may cause damage;
- disconnect any hydraulic connection, as this would require the entire brake system to be disassembled, drained, cleaned, properly filled and bled after reassembly.

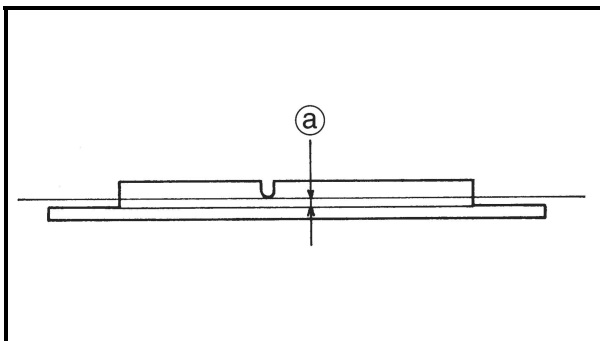
EBS00404

REPLACING THE FRONT BRAKE PADS

The following procedure applies to both of the front brake calipers.

NOTE: _____

It is not necessary to disassemble the brake calipers and brake hoses to replace the brake pads.



1. Remove:
 - brake pads
- ⓐ Wear limit

NOTE: _____

Replace the brake pads as a set if either is found to be worn to the wear limit.

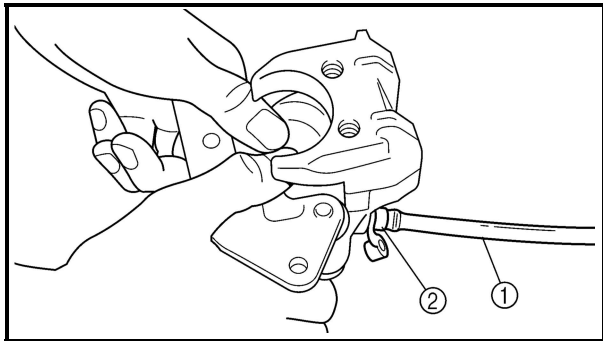
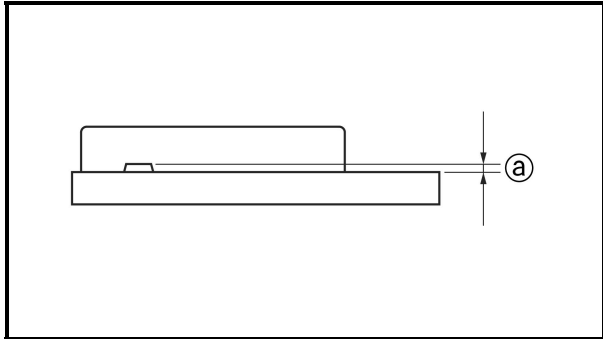


EBS00405

REPLACING THE REAR BRAKE PADS

NOTE: _____

It is not necessary to disassemble the brake caliper and brake hose to replace the brake pads.



1. Remove:
 - brake pads
 - ⓐ wear limit

NOTE: _____

Replace the brake pads as a set if either is found to be worn to the wear limit.

2. Install:
 - brake pads
 - brake pad spring

NOTE: _____

Always install new brake pads and brake pad spring as a set.



- a. Connect a suitable hose Ⓢ tightly to the brake caliper bleed screw ②. Put the other end of this hose into an open container.
- b. Loosen the brake caliper bleed screw and, using a finger, push the caliper piston into the brake caliper.
- c. Tighten the brake caliper bleed screw.

5 Nm (0.5 m•kg, 3.7 ft•lb)

- d. Install a new brake pad spring and new brake pads.



3. Install:
 - brake pad retaining bolts
(Bend the lock washer tabs along a flat side of the bolts)
 - brake caliper
 - brake caliper mounting bolts



Brake pad retaining bolt
17 Nm (1.7 m•kg, 13 ft•lb)
Brake caliper mounting bolt
34 Nm (3.4 m•kg, 25 ft•lb)

4. Check:
 - brake fluid level
Refer to "CHECKING THE BRAKE FLUID LEVEL" in chapter 3.



5. Check:

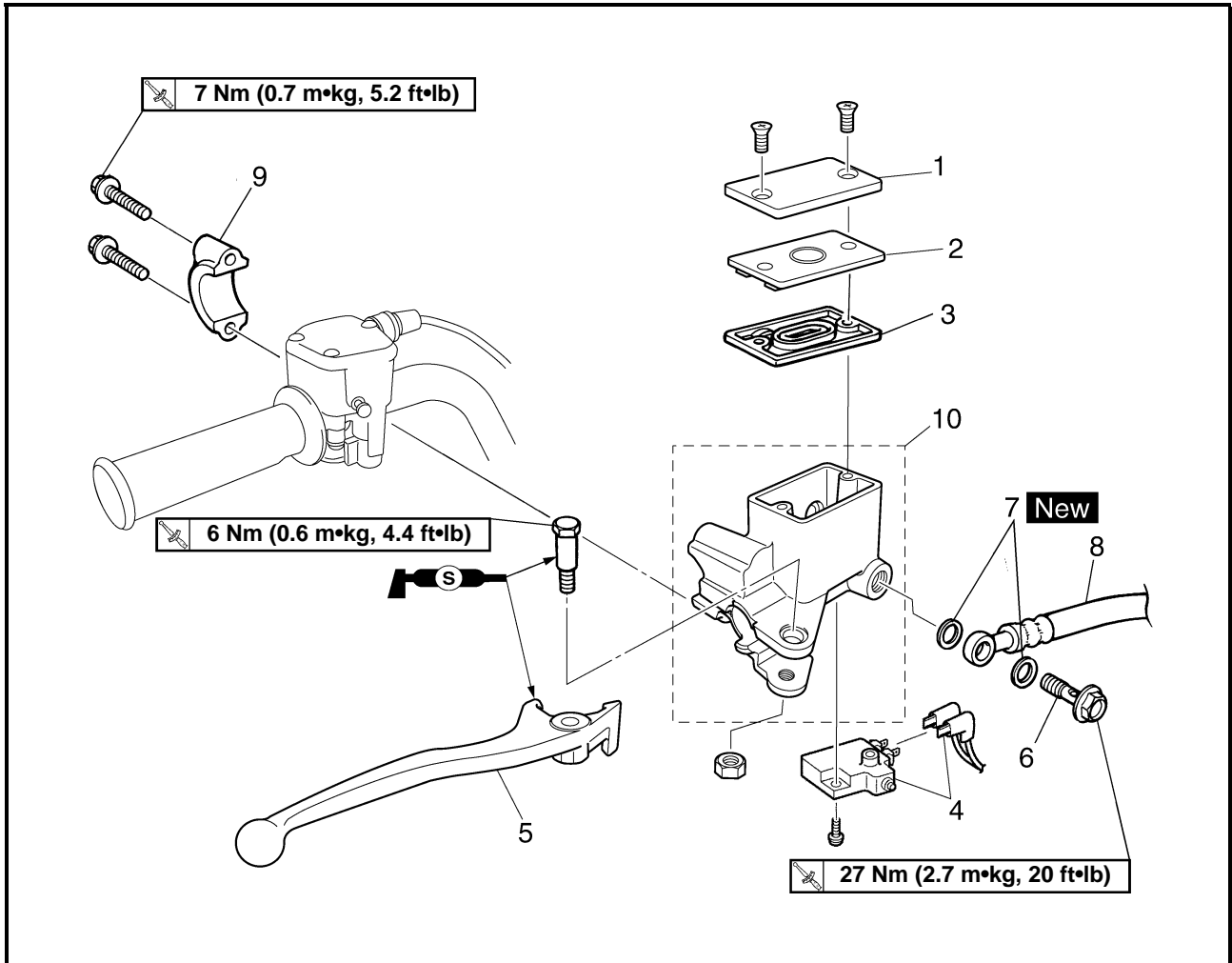
- brake lever or brake pedal operation
Soft or spongy feeling → Bleed the brake system.

Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.



EBS00407

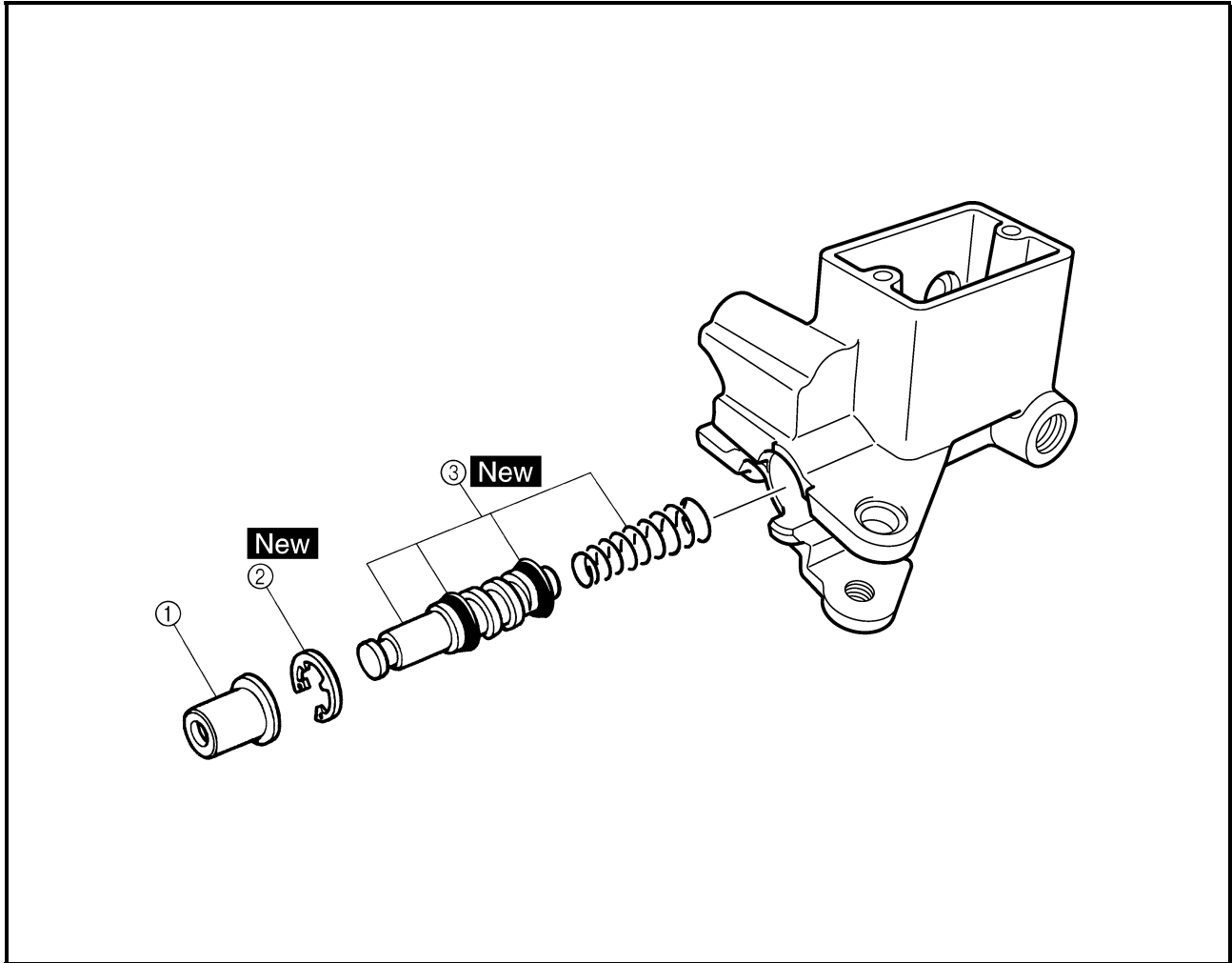
FRONT BRAKE MASTER CYLINDER



Order	Job/Part	Q'ty	Remarks
	Removing the front brake master cylinder		Remove the parts in the order listed.
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.
1	Brake fluid reservoir cap	1	
2	Brake fluid reservoir diaphragm plate	1	
3	Brake fluid reservoir diaphragm	1	
4	Front brake light switch	1	
5	Brake lever	1	
6	Union bolt	1	
7	Copper washer	2	
8	Brake hose	1	Disconnect. } Refer to "INSTALLING THE FRONT BRAKE MASTER CYLINDER".
9	Brake master cylinder bracket	1	
10	Brake master cylinder	1	
			For installation, reverse the removal procedure.



EBS00409

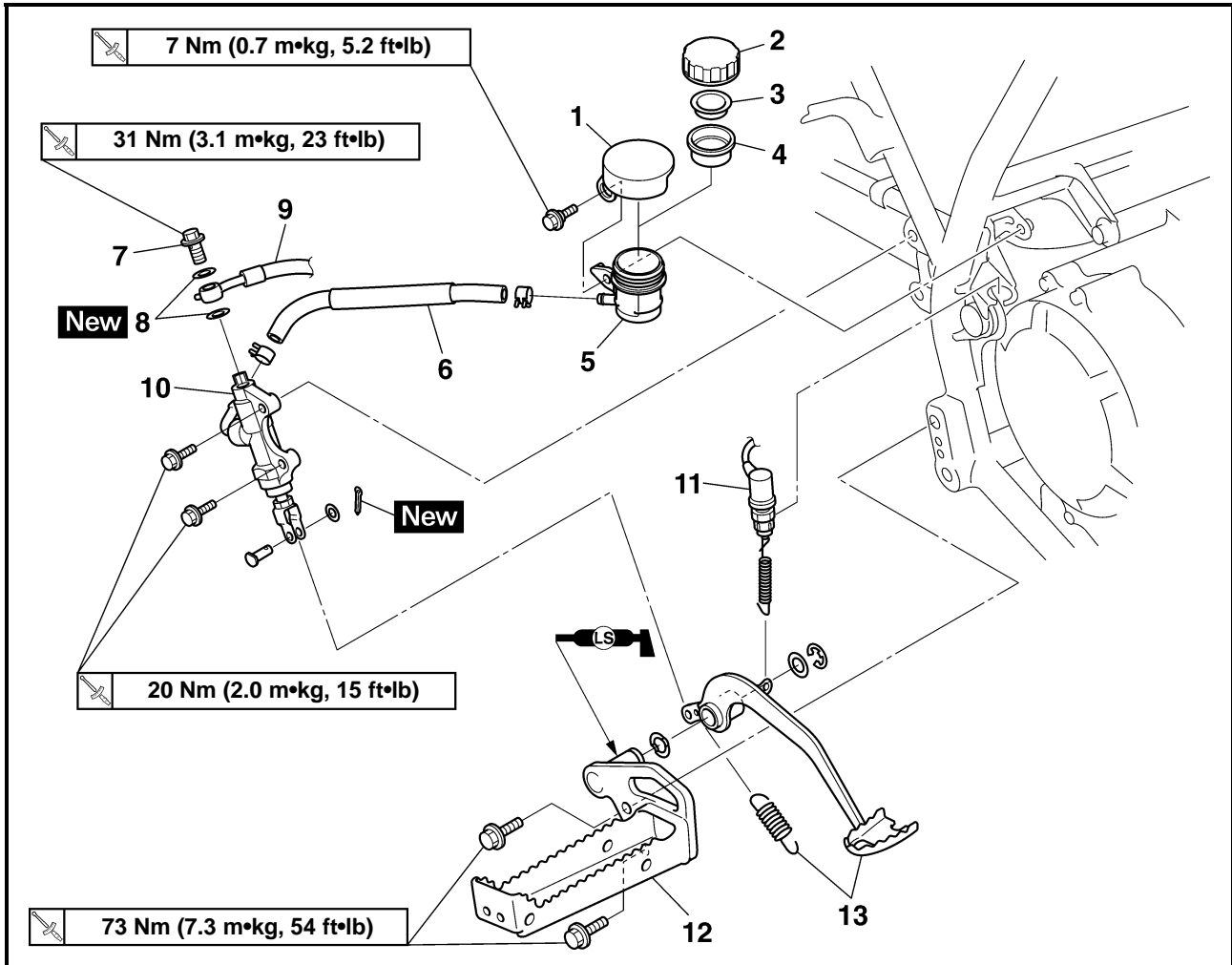


Order	Job/Part	Q'ty	Remarks
	Disassembling the front brake master cylinder		Remove the parts in the order listed.
①	Dust boot	1	Refer to "ASSEMBLING THE FRONT BRAKE MASTER CYLINDER". For assembly, reverse the disassembly procedure.
②	Circlip	1	
③	Brake master cylinder kit	1	

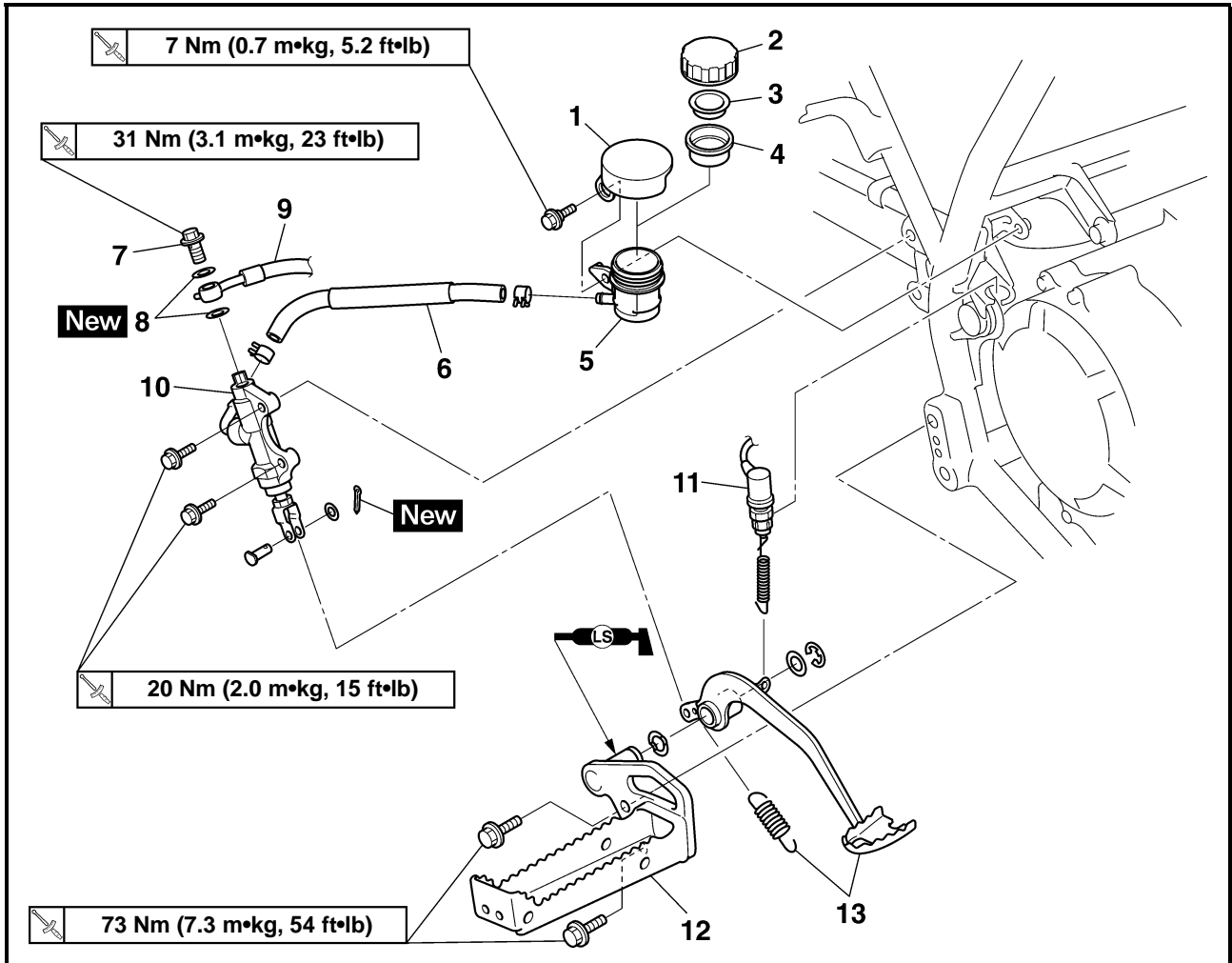


EBS00410

REAR BRAKE MASTER CYLINDER



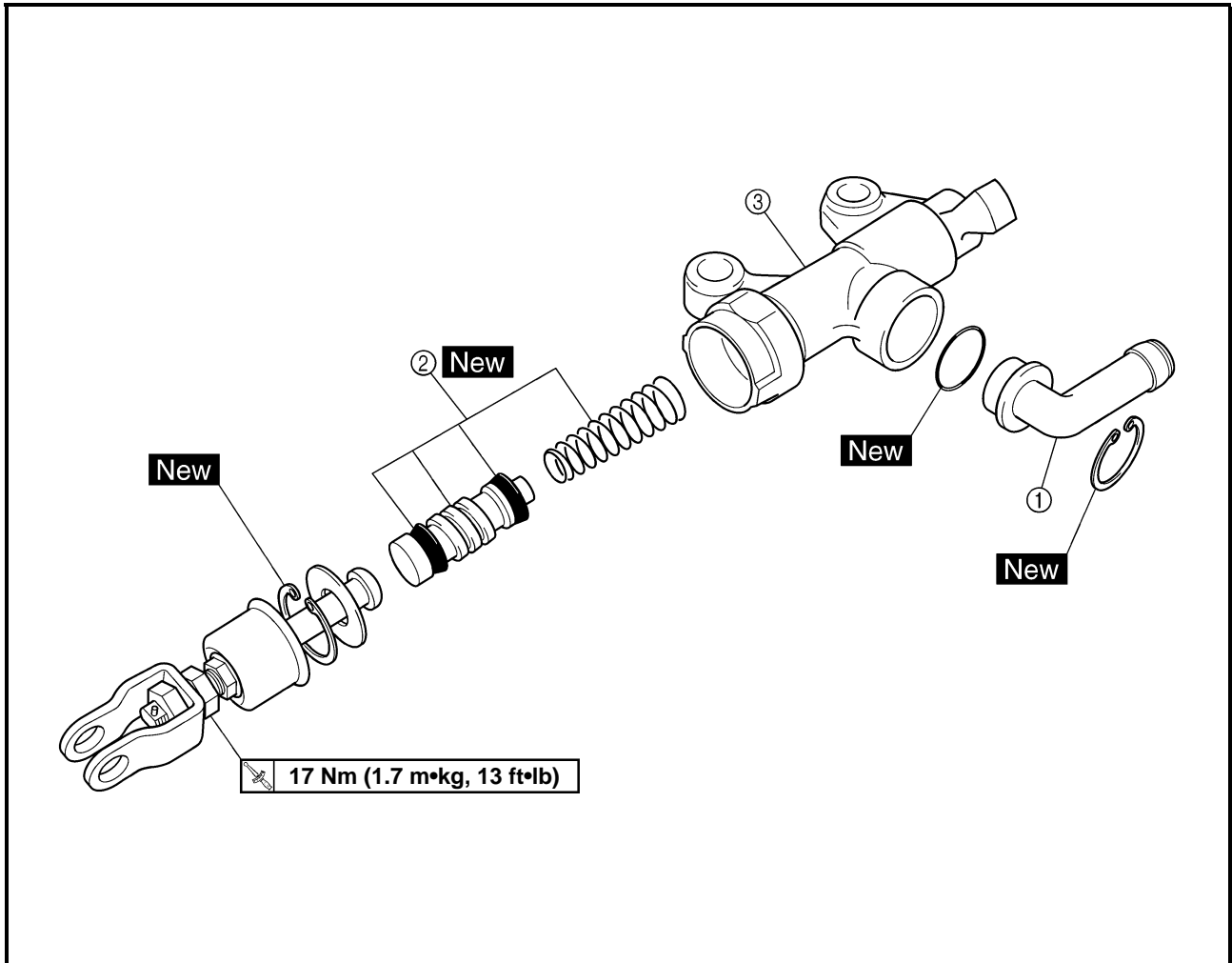
Order	Job/Part	Q'ty	Remarks
	Removing the rear brake master cylinder		Remove the parts in the order listed.
	Right foot protector		Refer to "SEAT, FENDERS AND FUEL TANK" in chapter 3.
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.
1	Brake fluid reservoir cover	1	
2	Brake fluid reservoir cap	1	
3	Brake fluid reservoir diaphragm holder	1	
4	Brake fluid reservoir diaphragm	1	
5	Brake fluid reservoir	1	
6	Brake fluid reservoir hose	1	



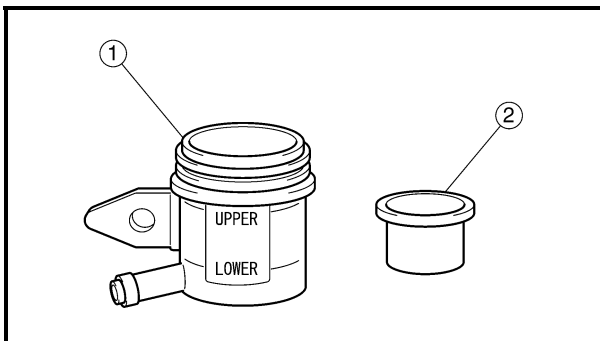
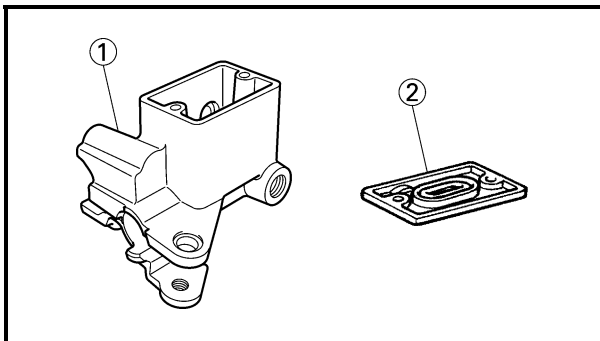
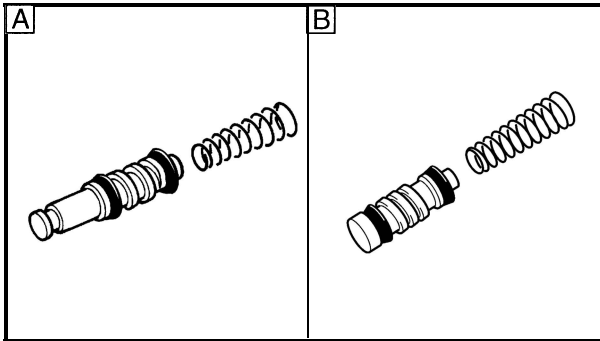
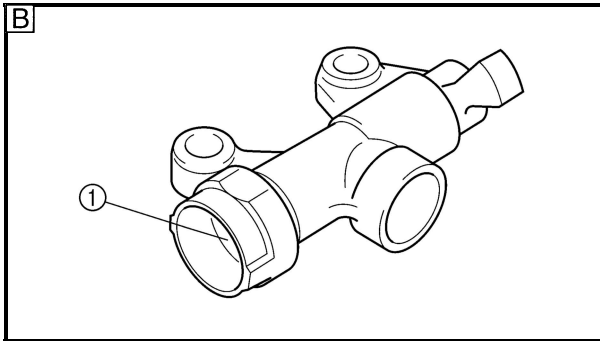
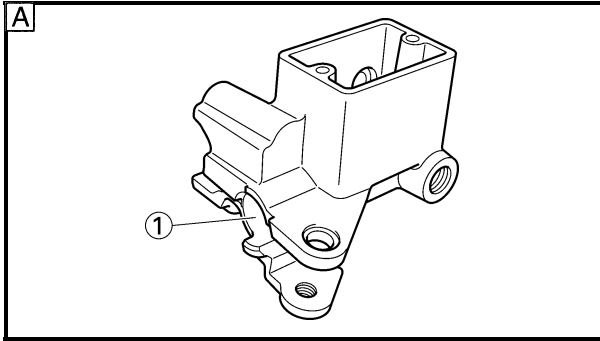
Order	Job/Part	Q'ty	Remarks
7	Union bolt	1] Refer to "INSTALLING THE REAR BRAKE MASTER CYLINDER".
8	Copper washer	2	
9	Brake hose	1	
10	Brake master cylinder	1	
11	Rear brake light switch	1] Disconnect.
12	Right footrest	1	
13	Brake pedal/spring	1/1	
			For installation, reverse the removal procedure.



EBS00411



Order	Job/Part	Q'ty	Remarks
	Disassembling the rear brake master cylinder		Remove the parts in the order listed.
①	Hose joint	1	Refer to "ASSEMBLING THE REAR BRAKE MASTER CYLINDER". For assembly, reverse the disassembly procedure.
②	Brake master cylinder kit	1	
③	Brake master cylinder	1	



EBS00413

CHECKING THE MASTER CYLINDERS

1. Check:

- brake master cylinder ①
Wear/scratches → Replace the brake master cylinder assembly.
- brake master cylinder body
Cracks/damage → Replace.
- brake fluid delivery passage (brake master cylinder body)
Blockage → Blow out with compressed air.

- A** Front
- B** Rear

2. Check:

- brake master cylinder kit
Scratches/wear/damage → Replace as a set.

- A** Front
- B** Rear

3. Check:

- front brake master cylinder reservoir ①
- front brake master cylinder reservoir diaphragm ②
Cracks/damage → Replace.

4. Check:

- rear brake fluid reservoir ①
- rear brake fluid reservoir diaphragm ②
Cracks/damage → Replace.



EBS00415

ASSEMBLING THE FRONT BRAKE MASTER CYLINDER

⚠ WARNING

- All internal brake components should be cleaned and lubricated with new brake fluid only before installation.



Recommended brake fluid
DOT 4

- Whenever a master cylinder is disassembled, replace the piston seals and dust seals.

EBS00416

ASSEMBLING THE REAR BRAKE MASTER CYLINDER

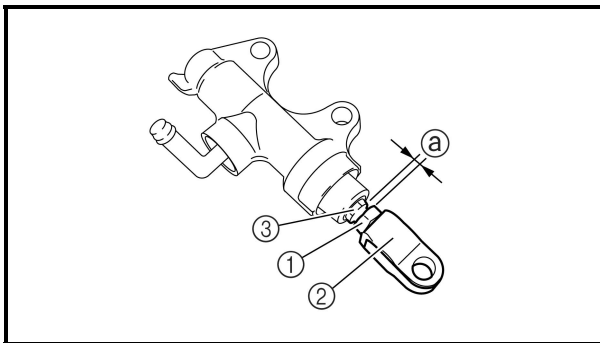
⚠ WARNING

- All internal brake components should be cleaned and lubricated with new brake fluid only before installation.



Recommended brake fluid
DOT 4

- Whenever a master cylinder is disassembled, replace the piston seals and dust seals.



1. Install:
 - brake master cylinder kit
 - nut ①
 - joint ②

NOTE:


Turn the adjusting bolt ③ until the clearance ④ is within the specified limits when install the joint ②.

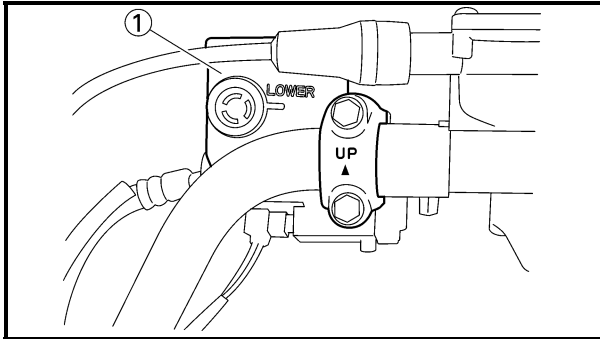


Clearance
2.2 ~ 3.2 mm (0.09 ~ 0.13 in)



2. Tighten:
- nut ①


	Nut 17 Nm (1.7 m•kg, 13 ft•lb)
---	--



EBS00418

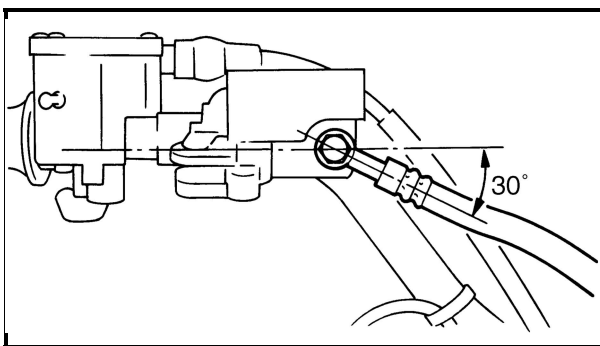
INSTALLING THE FRONT BRAKE MASTER CYLINDER

1. Install:
- brake master cylinder ①


	Brake master cylinder holder bolt 7 Nm (0.7 m•kg, 5.1 ft•lb)
---	--

NOTE:

- The “UP” mark on the brake master cylinder bracket should face up.
- Install the brake master cylinder so that the gaps between the brake master cylinder and the brake master cylinder bracket are equal.



2. Install:
- copper washers **New**
 - brake hose
 - union bolt

	Union bolt 27 Nm (2.7 m•kg, 20 ft•lb)
---	---

NOTE:

- Tighten the union bolt while holding the brake hose as shown.
- Turn the handlebar to the left and to the right to check that the brake hose does not touch other parts (throttle cable, wire harness, leads, etc.). Correct if necessary.

⚠ WARNING

Proper brake hose routing is essential to insure safe machine operation. Refer to “CABLE ROUTING” in chapter 2.



3. Fill:
 - brake fluid reservoir



Recommended brake fluid
DOT 4

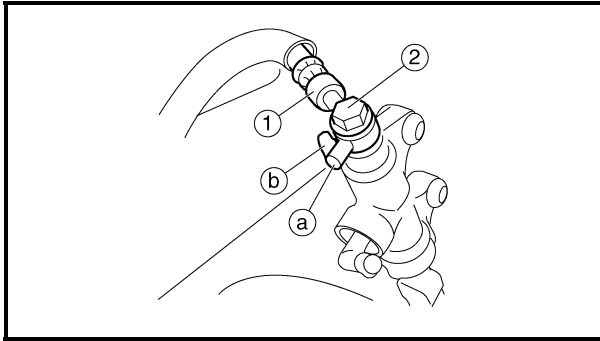
CAUTION:

Brake fluid may damage painted surfaces or plastic parts. Always clean up spilled brake fluid immediately.

⚠ WARNING

- Use only the designated quality brake fluid: other brake fluids may deteriorate the rubber seals, causing leakage and poor brake performance.
- Refill with the same type of brake fluid: mixing brake fluids may result in a harmful reaction and lead to poor brake performance.
- Be careful that water does not enter the brake master cylinder when refilling. Water will significantly lower the boiling point of the brake fluid and may result in vapor lock.

4. Air bleed:
 - brake system
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.
5. Check:
 - brake fluid level
Brake fluid level is under the “LOWER” level line → Add the recommended brake fluid to the proper level.
Refer to “CHECKING THE BRAKE FLUID LEVEL” in chapter 3.



EBS00419

INSTALLING THE REAR BRAKE MASTER CYLINDER

1. Install:
 - copper washers **New**
 - brake hose ①
 - union bolt ②

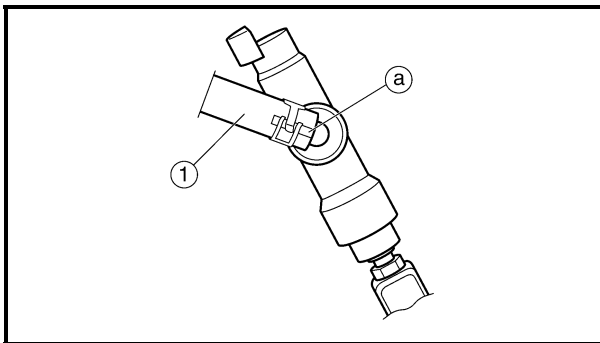
	<p>Union bolt 31 Nm (3.1 m•kg, 23 ft•lb)</p>
--	---

CAUTION: _____

When installing the brake hose onto the brake master cylinder, make sure the brake pipe ① touches the projection ② as shown.

⚠ WARNING _____

Proper brake hose routing is essential to insure safe machine operation. Refer to “CABLE ROUTING” in chapter 2.



2. Install:
 - brake fluid reservoir hose ①

NOTE: _____

Install the brake fluid reservoir hose with the white paint mark ① facing up as shown.

3. Fill:
 - brake fluid reservoir

	<p>Recommended brake fluid DOT 4</p>
--	---

CAUTION: _____

Brake fluid may damage painted surfaces or plastic parts. Always clean up spilled brake fluid immediately.

**⚠ WARNING**

- Use only the designated quality brake fluid: other brake fluids may deteriorate the rubber seals, causing leakage and poor brake performance.
- Refill with the same type of brake fluid: mixing brake fluids may result in a harmful chemical reaction and lead to poor brake performance.
- Be careful that water does not enter the brake master cylinder when refilling. Water will significantly lower the boiling point of the brake fluid and may result in vapor lock.

4. Air bleed:

- brake system

Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.

5. Check:

- brake fluid level

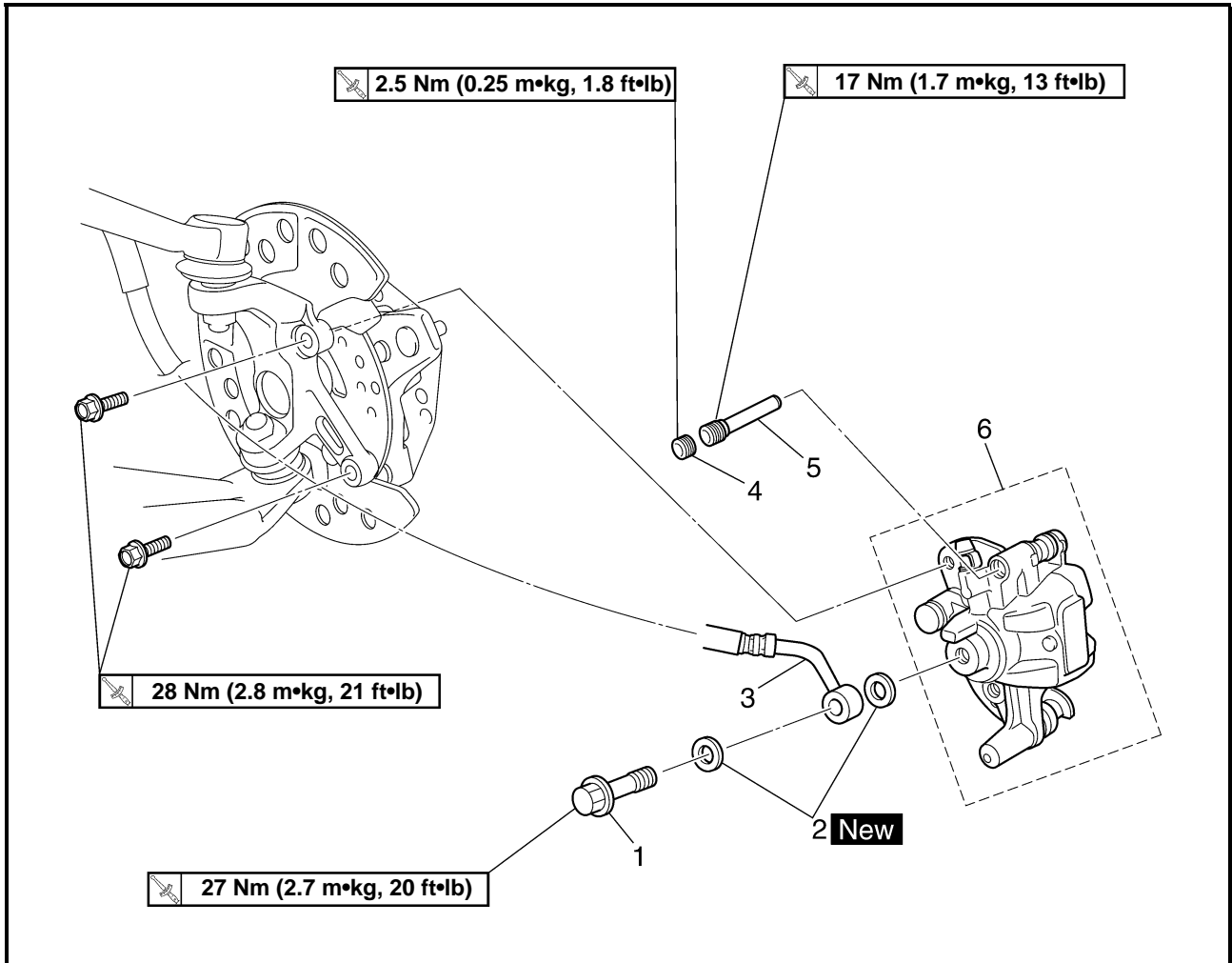
Brake fluid level is under the “LOWER” level line → Add the recommended brake fluid to the proper level.

Refer to “CHECKING THE BRAKE FLUID LEVEL” in chapter 3.



EBS00421

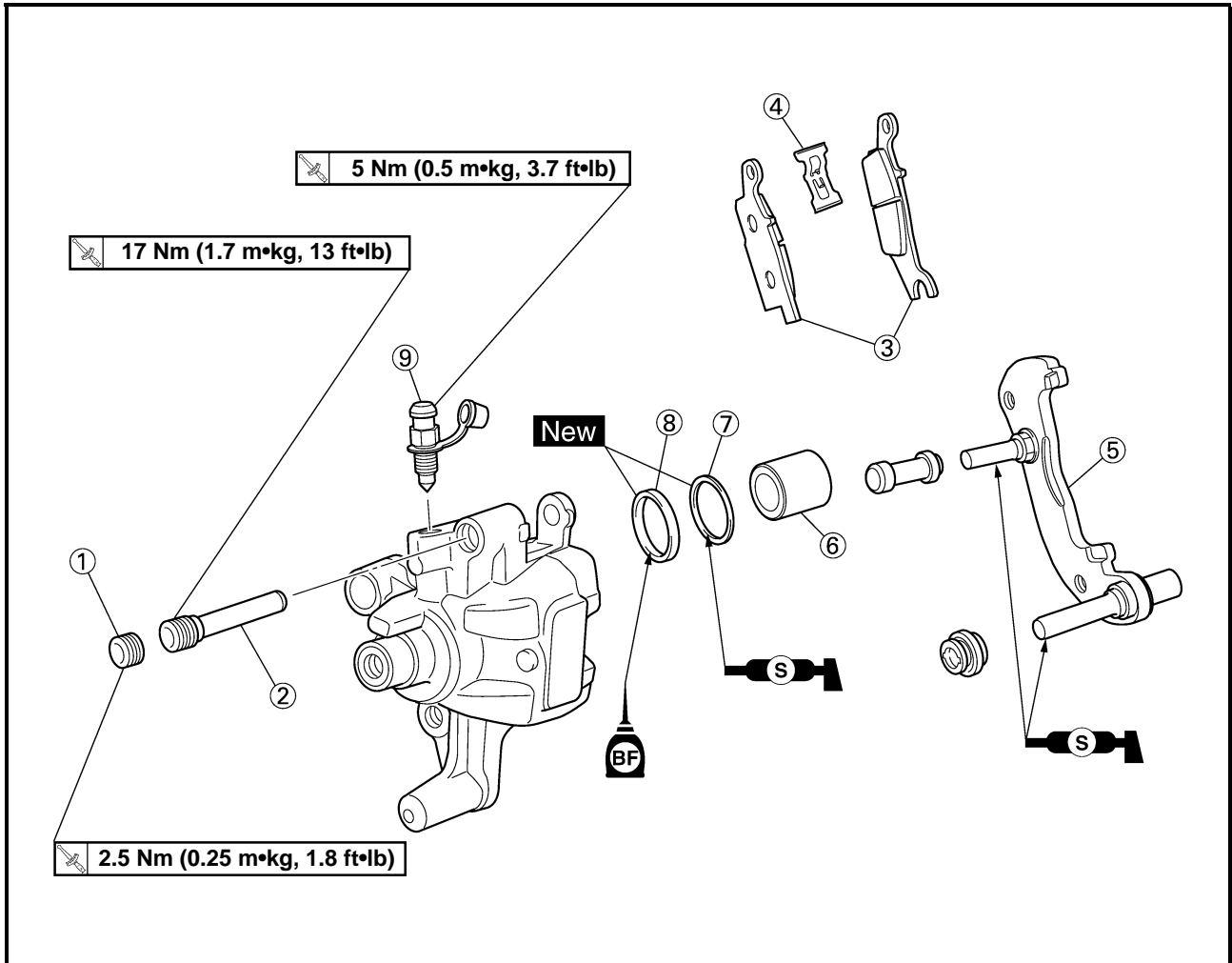
FRONT BRAKE CALIPERS



Order	Job/Part	Q'ty	Remarks
	Removing the front brake calipers		Remove the parts in the order listed. The following procedure applies to both of the front brake calipers.
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3. Refer to "FRONT AND REAR WHEELS".
1	Front wheel		
1	Union bolt	1	Disconnect. } Refer to "INSTALLING THE FRONT BRAKE CALIPERS". Loosen. }
2	Copper washer	2	
3	Brake hose	1	
4	Bolt	1	
5	Brake pad retaining bolt	2	
6	Brake caliper assembly	1	
			For installation, reverse the removal procedure.



EBS00423

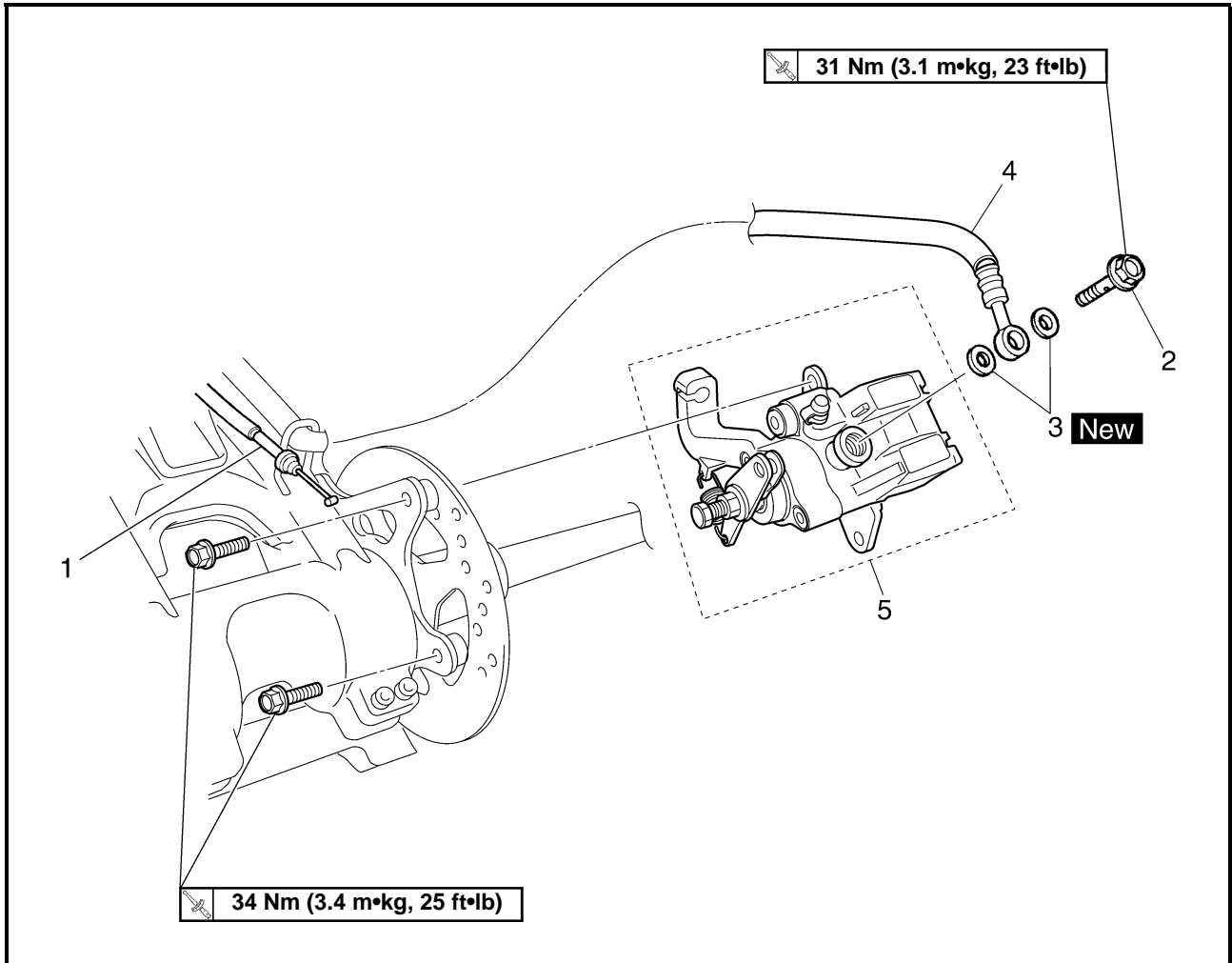


Order	Job/Part	Q'ty	Remarks
	Disassembling the front brake calipers		Remove the parts in the order listed.
			The following procedure applies to both of the front brake calipers.
①	Bolt	1	Refer to "DISASSEMBLING THE FRONT AND REAR BRAKE CALIPERS" and "ASSEMBLING THE FRONT BRAKE CALIPERS". For assembly, reverse the disassembly procedure.
②	Brake pad retaining bolt	1	
③	Brake pad	2	
④	Brake pad spring	1	
⑤	Caliper bracket	1	
⑥	Caliper piston	1	
⑦	Dust seal	1	
⑧	Caliper piston seal	1	
⑨	Bleed screw	1	



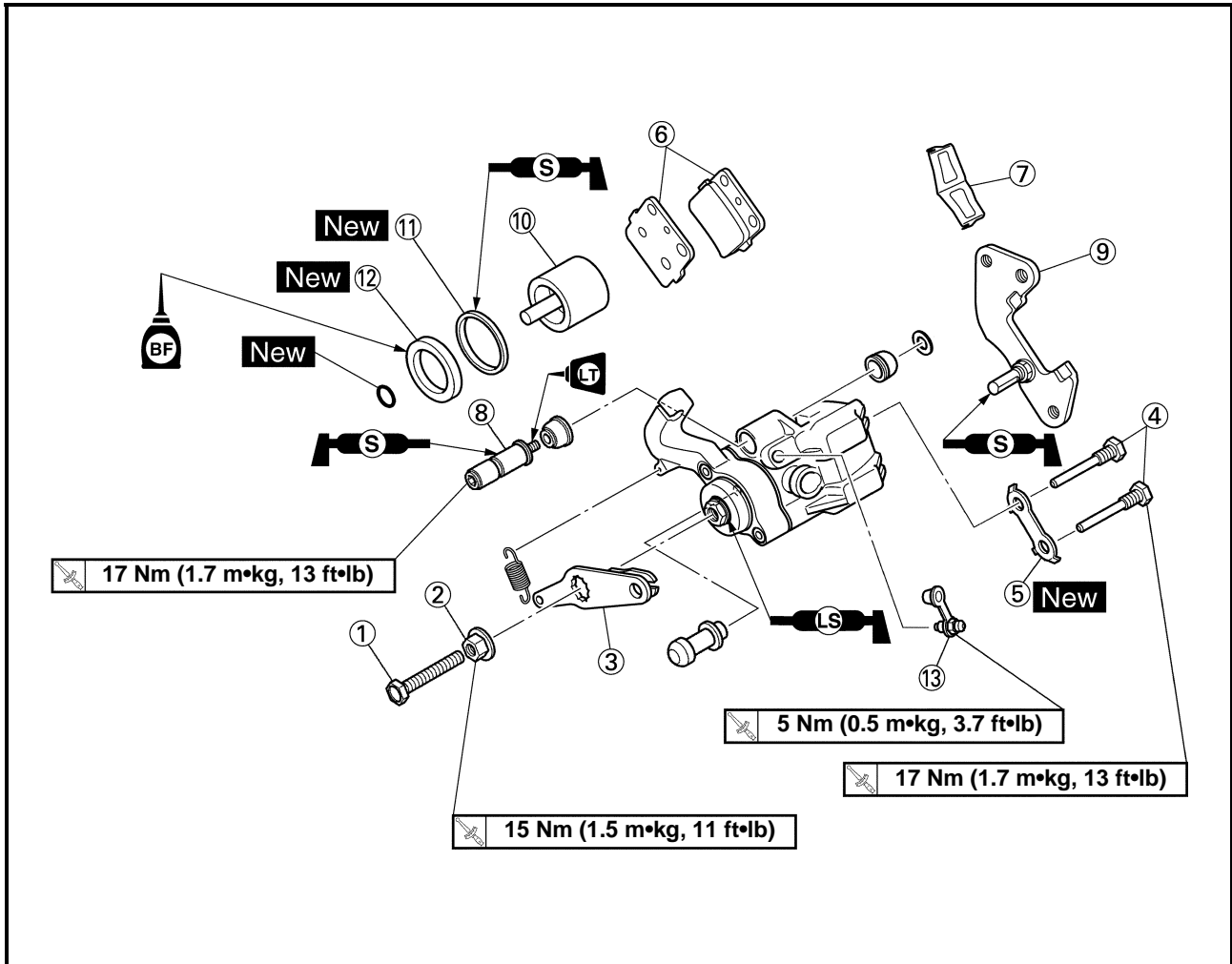
EBS00424

REAR BRAKE CALIPER



Order	Job/Part	Q'ty	Remarks
	Removing the rear brake caliper		Remove the parts in the order listed.
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.
1	Parking brake cable	1	Disconnect. Refer to "REMOVING THE PARKING BRAKE CABLE".
2	Union bolt	1] Refer to "INSTALLING THE REAR BRAKE CALIPER".
3	Copper washer	2	
4	Brake hose	1	
5	Brake caliper assembly	1	Disconnect.
			For installation, reverse the removal procedure.

EBS00425



Order	Job/Part	Q'ty	Remarks
	Disassembling the rear brake caliper		Remove the parts in the order listed.
①	Adjusting bolt	1	Refer to "DISASSEMBLING THE FRONT AND REAR BRAKE CALIPERS" and "ASSEMBLING THE REAR BRAKE CALIPER". For assembly, reverse the disassembly procedure.
②	Locknut	1	
③	Parking brake arm	1	
④	Brake pad retain bolt	2	
⑤	Lock washer	1	
⑥	Brake pad	2	
⑦	Brake pad spring	1	
⑧	Retaining bolt	1	
⑨	Caliper bracket	1	
⑩	Brake caliper piston	1	
⑪	Dust seal	1	
⑫	Caliper piston seal	1	
⑬	Bleed screw	1	



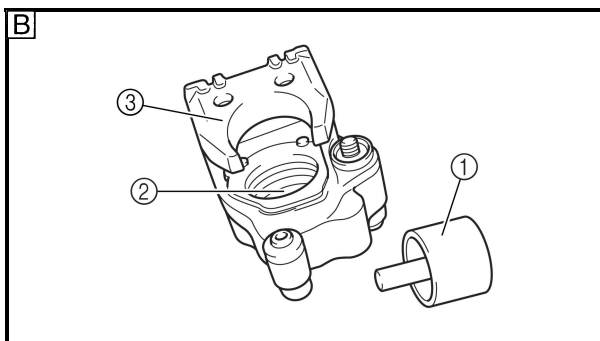
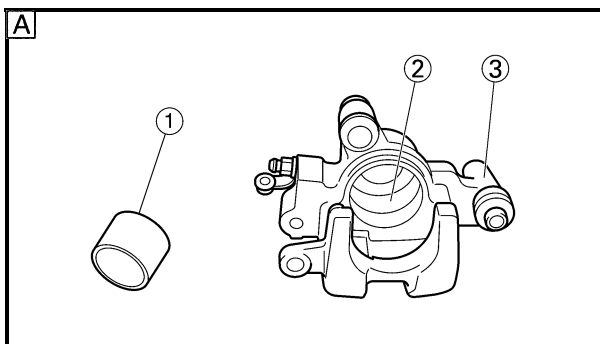
EBS00429

CHECKING THE FRONT AND REAR BRAKE CALIPERS

Recommended brake component replacement schedule	
Brake pads	As required
Piston seals, dust seals	Every two years
Brake hoses	Every four years
Brake fluid	Replace when brakes are disassembled.

⚠ WARNING

All internal brake components should be cleaned in new brake fluid only. Do not use solvents as they will cause seals to swell and distort.



1. Check:

- brake caliper piston ①
Scratches/rust/wear → Replace the brake caliper assembly.
- brake caliper cylinder ②
Wear/scratches → Replace the brake caliper assembly.
- brake caliper body ③
Cracks/damage → Replace.
- brake fluid delivery passage (brake caliper body)
Blockage → Blow out with compressed air.

⚠ WARNING

Replace the caliper piston seal and dust seal whenever the brake caliper is disassembled.

- A** Front
- B** Rear



EBS00431

ASSEMBLING THE FRONT BRAKE CALIPERS

The following procedure applies to both of the front brake calipers.

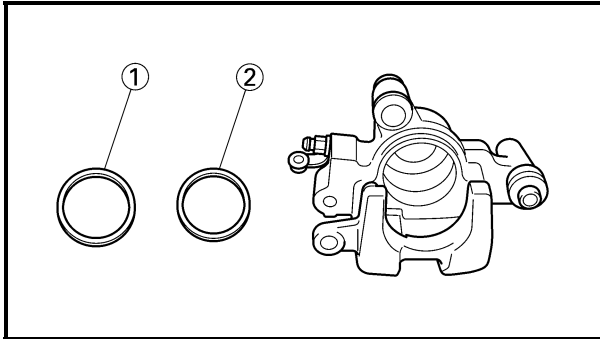
⚠ WARNING

- All internal brake components should be cleaned and lubricated with new brake fluid only before installation.

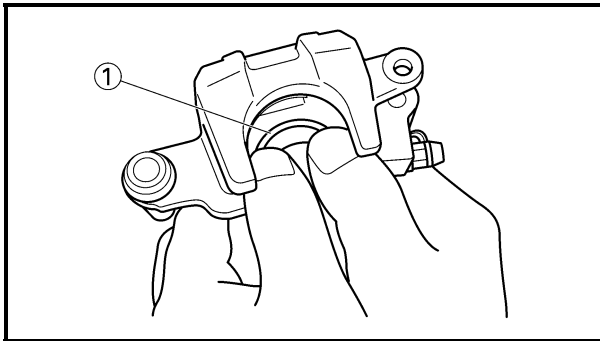


Recommended brake fluid
DOT 4

- Replace the caliper piston seal whenever a brake caliper is disassembled.



1. Install:
 - caliper piston seal ① **New**
 - caliper dust seal ② **New**



2. Install:
 - brake caliper piston ①

EBS00432

ASSEMBLING THE REAR BRAKE CALIPER

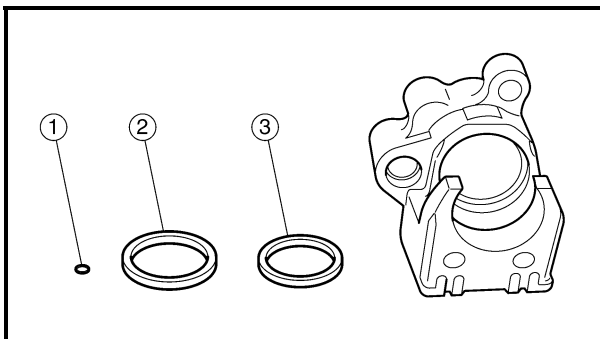
⚠ WARNING

- All internal brake components should be cleaned and lubricated with new brake fluid only before installation.

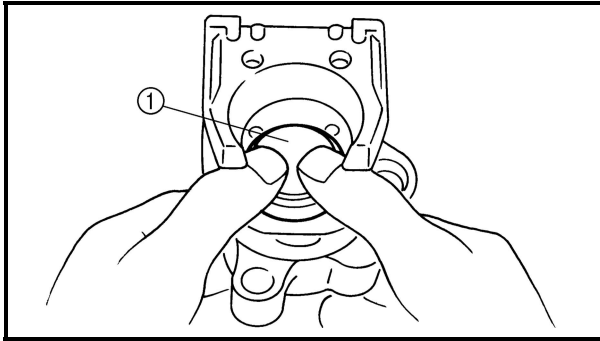


Recommended brake fluid
DOT 4

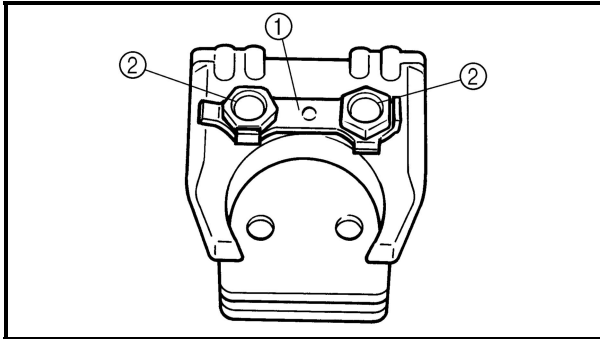
- Replace the caliper piston seal whenever a brake caliper is disassembled.



1. Install:
 - O-ring ① **New**
 - caliper piston seal ② **New**
 - caliper dust seal ③ **New**



2. Install:
- brake caliper piston ①

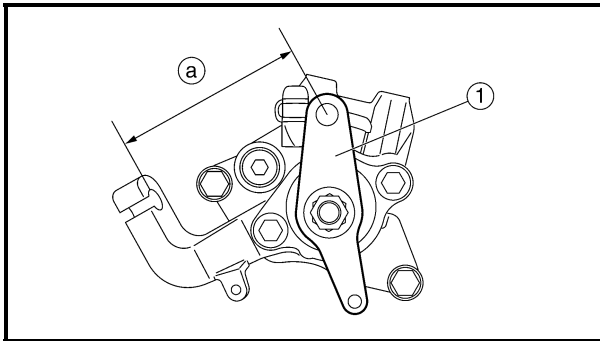


3. Install:
- lock washer ① **New**
 - brake pad retaining bolts ②



Brake pad retaining bolt
17 Nm (1.7 m•kg, 13 ft•lb)

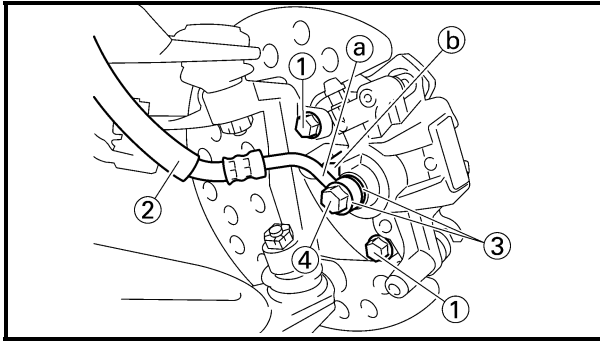
4. Bend the lock washer tabs along a flat side of the bolts.



5. Install:
- parking brake arm ①
6. Measure:
- parking brake arm to parking brake bracket distance ②
- Out of specification → Adjust.



Parking brake arm to parking brake bracket distance
73.3 mm (2.89 in)



EBS00434

INSTALLING THE FRONT BRAKE CALIPERS

The following procedure applies to both of the front brake calipers.

1. Install:
 - brake caliper assembly
 - brake caliper mounting bolts ①

	<p>Brake caliper mounting bolt 28 Nm (2.8 m•kg, 21 ft•lb)</p>
--	--

- brake hose ②
- copper washers ③ **New**
- union bolt ④

	<p>Union bolt 27 Nm (2.7 m•kg, 20 ft•lb)</p>
--	---

CAUTION: _____

When installing the brake hose on the brake caliper, make sure that the brake pipe ① touches the projection ② on the brake caliper.

⚠ WARNING _____

Proper brake hose routing is essential to insure safe machine operation. Refer to “CABLE ROUTING” in chapter 2.

2. Fill:
 - brake reservoir

	<p>Recommended brake fluid DOT 4</p>
--	---

CAUTION: _____

Brake fluid may damage painted surfaces or plastic parts. Always clean up spilled brake fluid immediately.

**⚠ WARNING**

- Use only the designated quality brake fluid: other brake fluids may deteriorate the rubber seals, causing leakage and poor brake performance.
- Refill with the same type of brake fluid: mixing brake fluids may result in a harmful chemical reaction and lead to poor brake performance.
- Be careful that water does not enter the master cylinder when refilling. Water will significantly lower the boiling point of the brake fluid and may result in vapor lock.

3. Air bleed:

- brake system

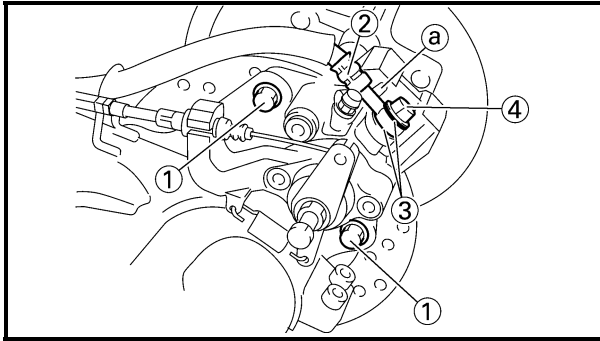
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.

4. Check:

- brake fluid level

Brake fluid level is below the “LOWER” level line → Add the recommended brake fluid to the proper level.


Refer to “CHECKING THE BRAKE FLUID LEVEL” in chapter 3.




EBS00436

INSTALLING THE REAR BRAKE CALIPER

1. Install:
 - brake caliper assembly
 - brake caliper mounting bolts ①

	Brake caliper mounting bolt 34 Nm (3.4 m•kg, 25 ft•lb)
---	--

- brake hose ②
- copper washers ③ **New**
- union bolt ④

	Union bolt 31 Nm (3.1 m•kg, 23 ft•lb)
---	---

CAUTION: _____

When installing the brake hose on the brake caliper, make sure that the brake pipe touches the projection ③ on the brake caliper.

⚠ WARNING _____

Proper brake hose routing is essential to insure safe machine operation. Refer to “CABLE ROUTING” in chapter 2.

2. Fill:
 - brake reservoir

	Recommended brake fluid DOT 4
---	---

CAUTION: _____

Brake fluid may damage painted surfaces or plastic parts. Always clean up spilled brake fluid immediately.

**⚠ WARNING**

- Use only the designated quality brake fluid: other brake fluids may deteriorate the rubber seals, causing leakage and poor brake performance.
- Refill with the same type of brake fluid: mixing brake fluids may result in a harmful chemical reaction and lead to poor brake performance.
- Be careful that water does not enter the master cylinder when refilling. Water will significantly lower the boiling point of the brake fluid and may result in vapor lock.

3. Air bleed:

- brake system

Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.

4. Check:

- brake fluid level

Brake fluid level is below the “LOWER” level line → Add the recommended brake fluid to the proper level.

Refer to “CHECKING THE BRAKE FLUID LEVEL” in chapter 3.

5. Adjust:

- parking brake cable end length

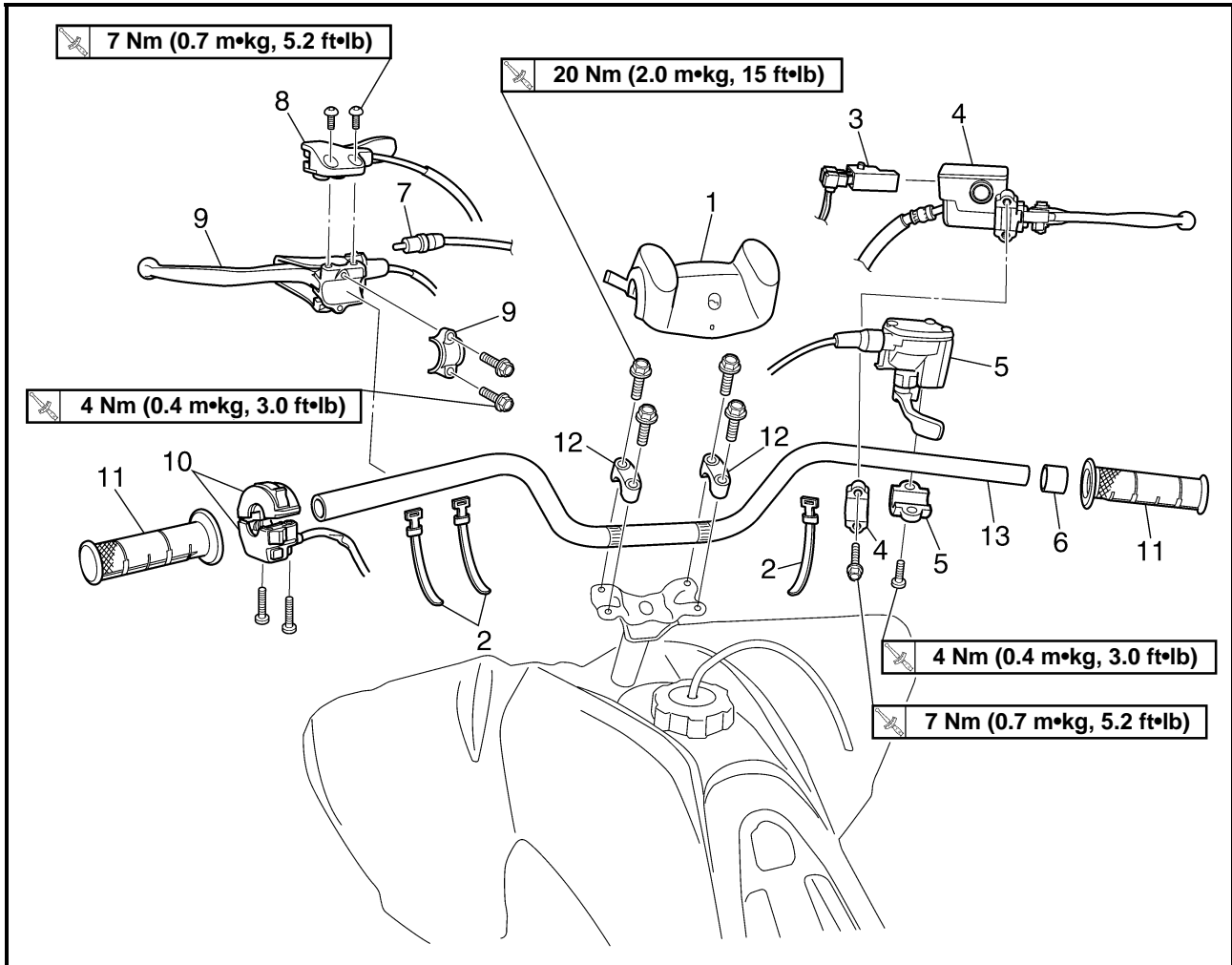
Refer to “ADJUSTING THE PARKING BRAKE” in chapter 3.



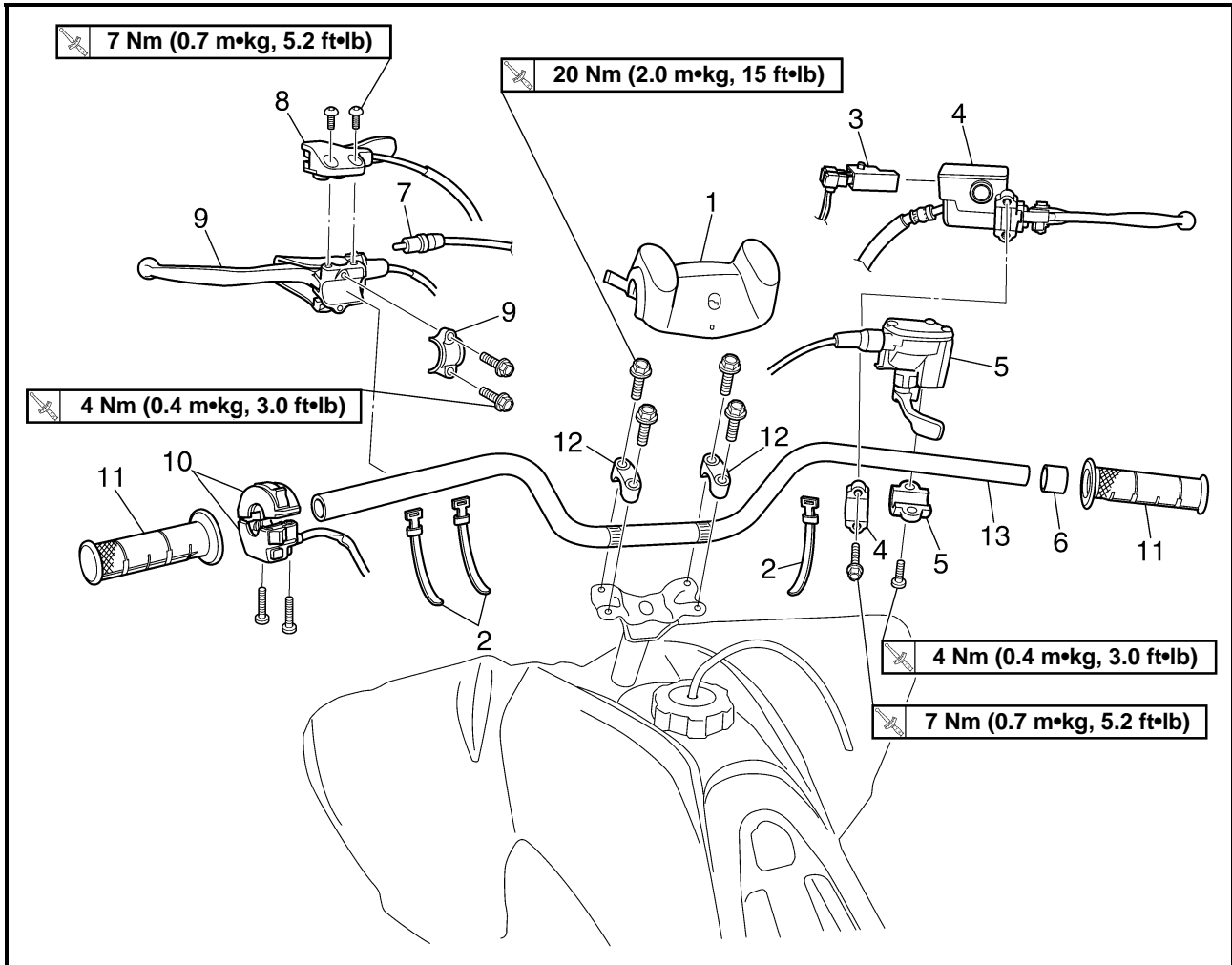
EBS00444

STEERING SYSTEM

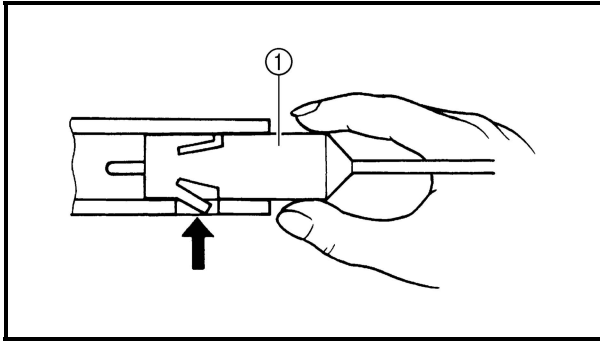
HANDLEBAR



Order	Job/Part	Q'ty	Remarks
	Removing the handlebar		Remove the parts in the order listed.
1	Handlebar protector	1	
2	Band	3	
3	Front brake light switch	1	
4	Brake master cylinder/bracket	1/1	Refer to "INSTALLING THE BRAKE MASTER CYLINDER".
5	Throttle lever assembly/bracket	1/1	
6	Spacer	1	
7	Clutch switch	1	Refer to "REMOVING THE CLUTCH SWITCH".
8	Parking brake lever	1	
9	Clutch lever/bracket	1/1	Refer to "INSTALLING THE CLUTCH LEVER".
10	Handlebar switch	1	



Order	Job/Part	Q'ty	Remarks
11	Handlebar grip	2	Refer to "REMOVING THE HANDLEBAR GRIPS" and "INSTALLING THE HANDLEBAR GRIPS".
12	Handlebar holder	2	Refer to "INSTALLING THE HANDLEBAR".
13	Handlebar	1	
			For installation, reverse the removal procedure.

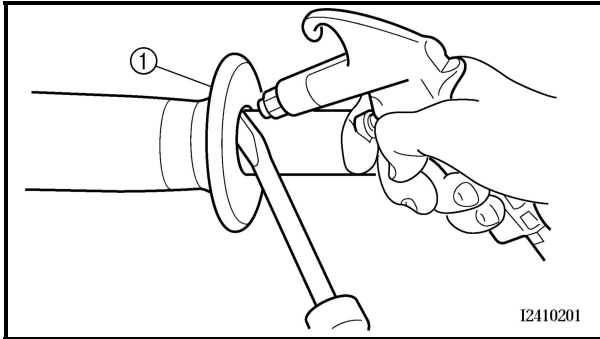


EBS00446

REMOVING THE CLUTCH SWITCH

1. Remove:
 - clutch switch ①

NOTE: _____
 Push the fastener when removing the clutch switch out of the clutch lever holder.

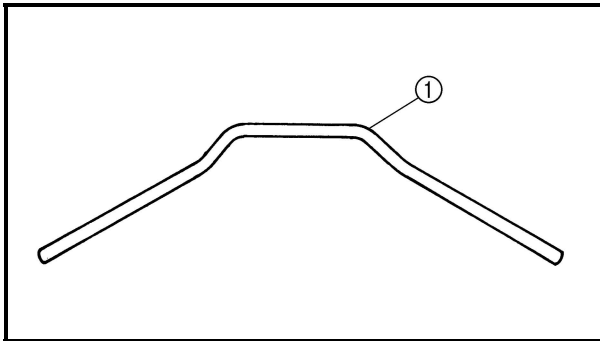


EBS00447

REMOVING THE HANDLEBAR GRIPS

1. Remove:
 - handlebar grips ①

NOTE: _____
 Blow compressed air between the handlebar and handlebar grip, and gradually push the grip off the handlebar.



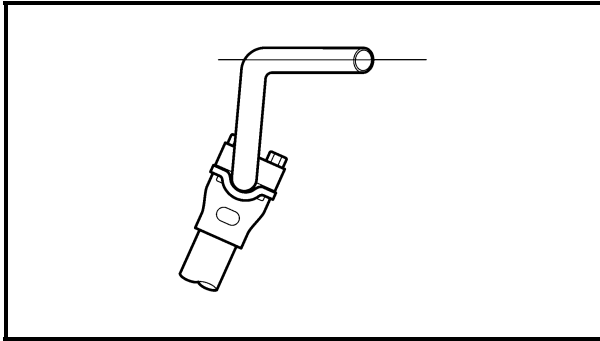
EBS00448

CHECKING THE HANDLEBAR

1. Check:
 - handlebar ①
 Bends/cracks/damage → Replace.

⚠ WARNING _____

Do not attempt to straighten a bent handlebar as this may dangerously weaken the handlebar.



EBS00449

INSTALLING THE HANDLEBAR

1. Install:
 - handlebar
 - handlebar holders



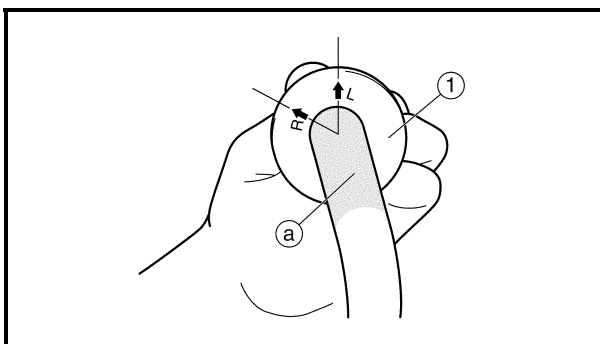
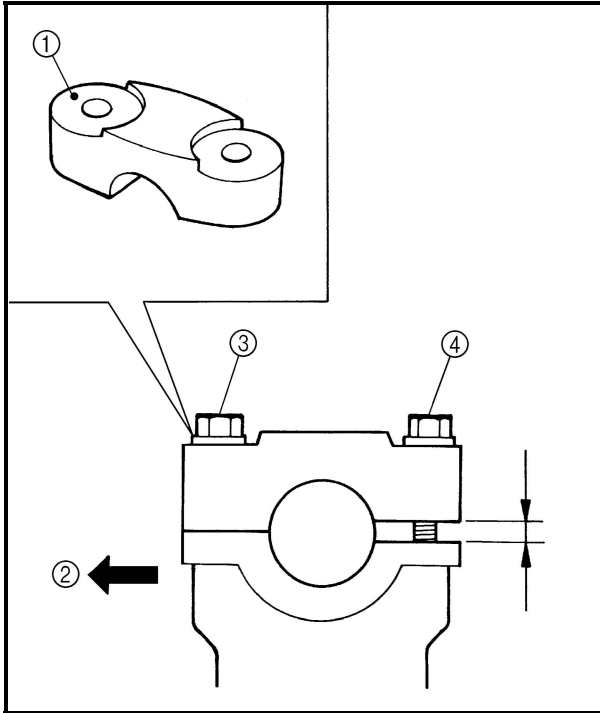
Handlebar holder
20 Nm (2.0 m•kg, 15 ft•lb)

NOTE:

- Install the handlebar horizontally shown in the illustration.
- The upper handlebar holder should be installed with the punched mark ① forward ②.

CAUTION:

First tighten the bolt ③ on the front side of the handlebar holder, and then tighten the bolt ④ on the rear side.



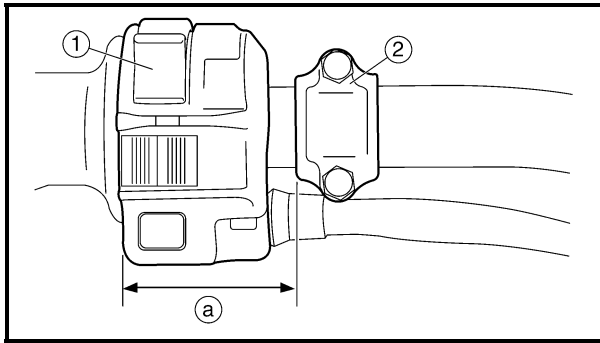
EBS00450

INSTALLING THE HANDLEBAR GRIPS

1. Install:
 - handlebar grips ①

NOTE:

- Before applying the adhesive, wipe off grease or oil on the handlebar surface ① with a lacquer thinner.
- Install the handlebar grips so that the “L” arrow on the left grip and “R” arrow on the right grip are placed vertically.



EBS00452

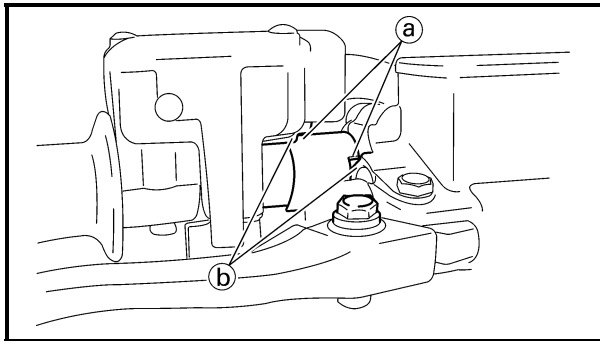
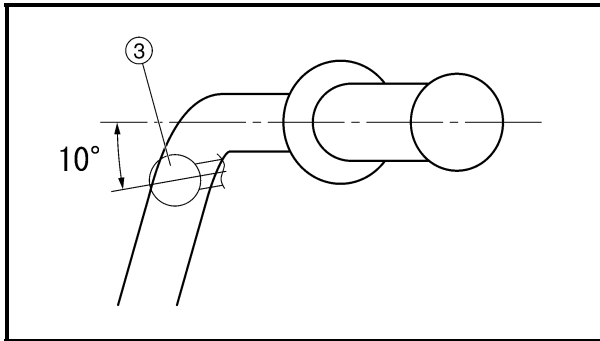
INSTALLING THE CLUTCH LEVER

1. Install:
 - handlebar switch ①
 - clutch lever
 - clutch lever bracket ②

NOTE:

- Install the clutch lever bracket as shown.
- Install the clutch lever ③ at 10 degrees angle as shown.

② 53 ~ 54 mm (2.09 ~ 2.13 in)



EBS00453

INSTALLING THE BRAKE MASTER CYLINDER

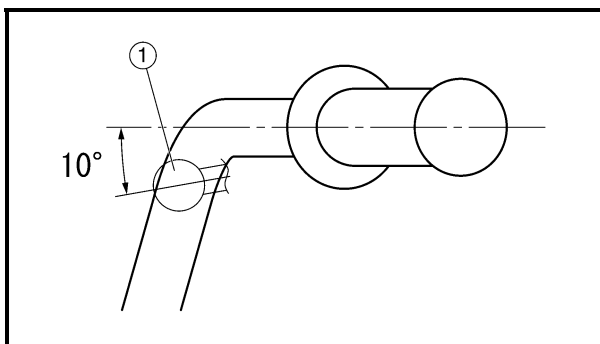
1. Install:
 - throttle lever assembly
 - spacer
 - brake master cylinder



**Brake master cylinder bracket
7 Nm (0.7 m•kg, 5.2 ft•lb)**

NOTE:

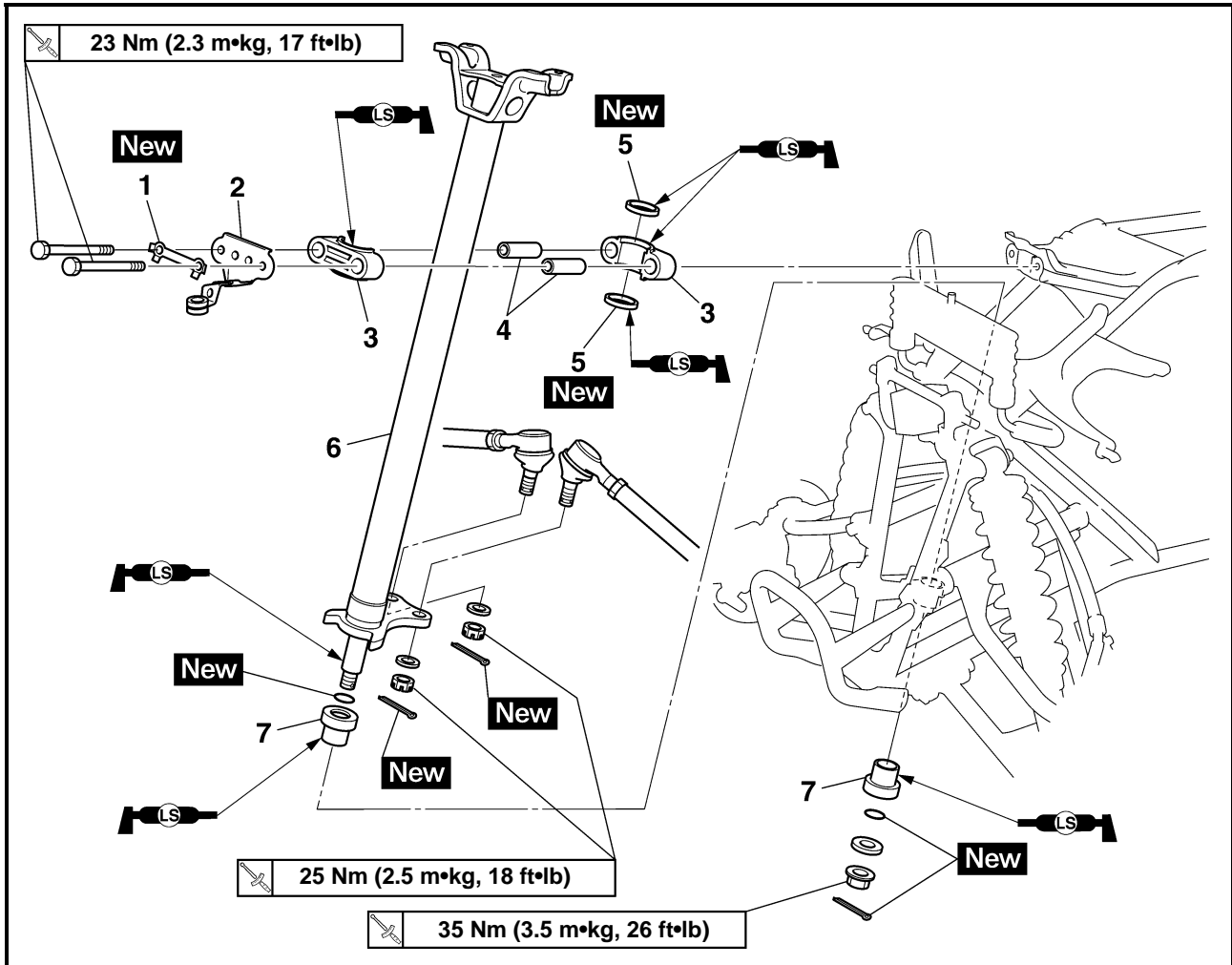
- Engage the indentations ① in the spacer with the lobes ② on the throttle lever assembly and brake master cylinder.
- The “UP” mark on the brake master cylinder bracket should face up.
- Install the brake lever ① at 10 degrees angle as shown.



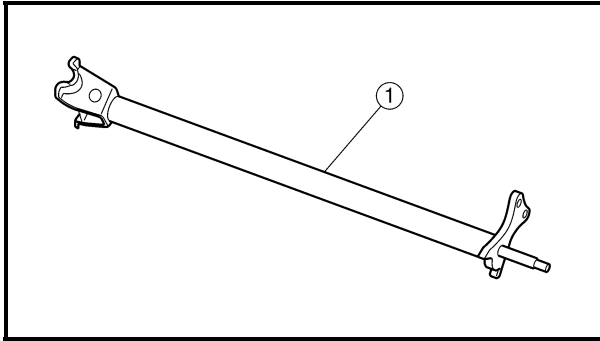


EBS00454

STEERING STEM



Order	Job/Part	Q'ty	Remarks
	Removing the steering stem		
	Front fender		Remove the parts in the order listed. Refer to "SEAT, FENDERS AND FUEL TANK" in chapter 3.
1	Lock washer	1	Refer to "INSTALLING THE LOCK WASHER".
2	Bracket	1	
3	Steering stem bushing	2	
4	Spacer	2	
5	Oil seal	2	
6	Steering stem	1	
7	Bushing	2	



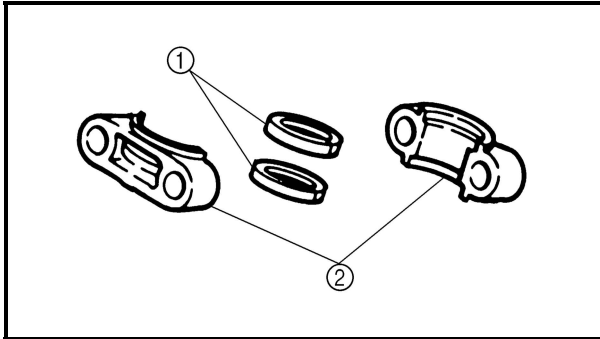
EBS00456

CHECKING THE STEERING STEM

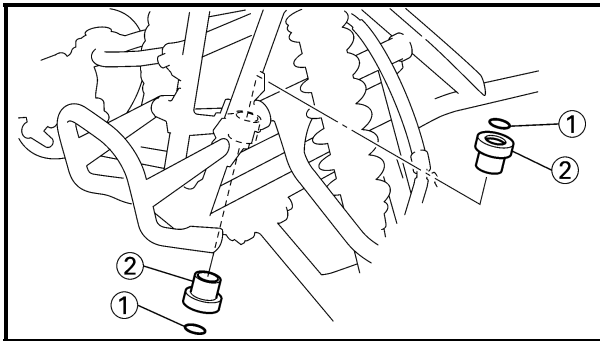
1. Check:
 - steering stem
Bends/damage → Replace.

⚠ WARNING

Do not attempt to straighten a bent stem; this may dangerously weaken the stem.



2. Check:
 - oil seals ① **New**
 - steering stem bushings ②
Wear/damage → Replace.



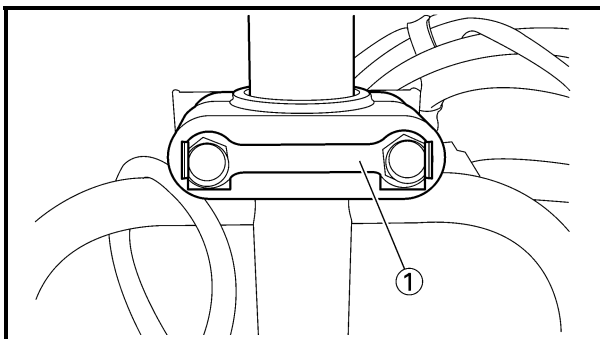
3. Check
 - O-rings ① **New**
 - bushings ②
Wear/damage → Replace.

INSTALLING THE STEERING STEM

1. Install:
 - steering stem

NOTE:

Pass the throttle cable through the cable guide. Refer to “CABLE ROUTING” in chapter 2.



EBS00459

INSTALLING THE LOCK WASHER

1. Install:
 - lock washer ① **New**
 - bolts



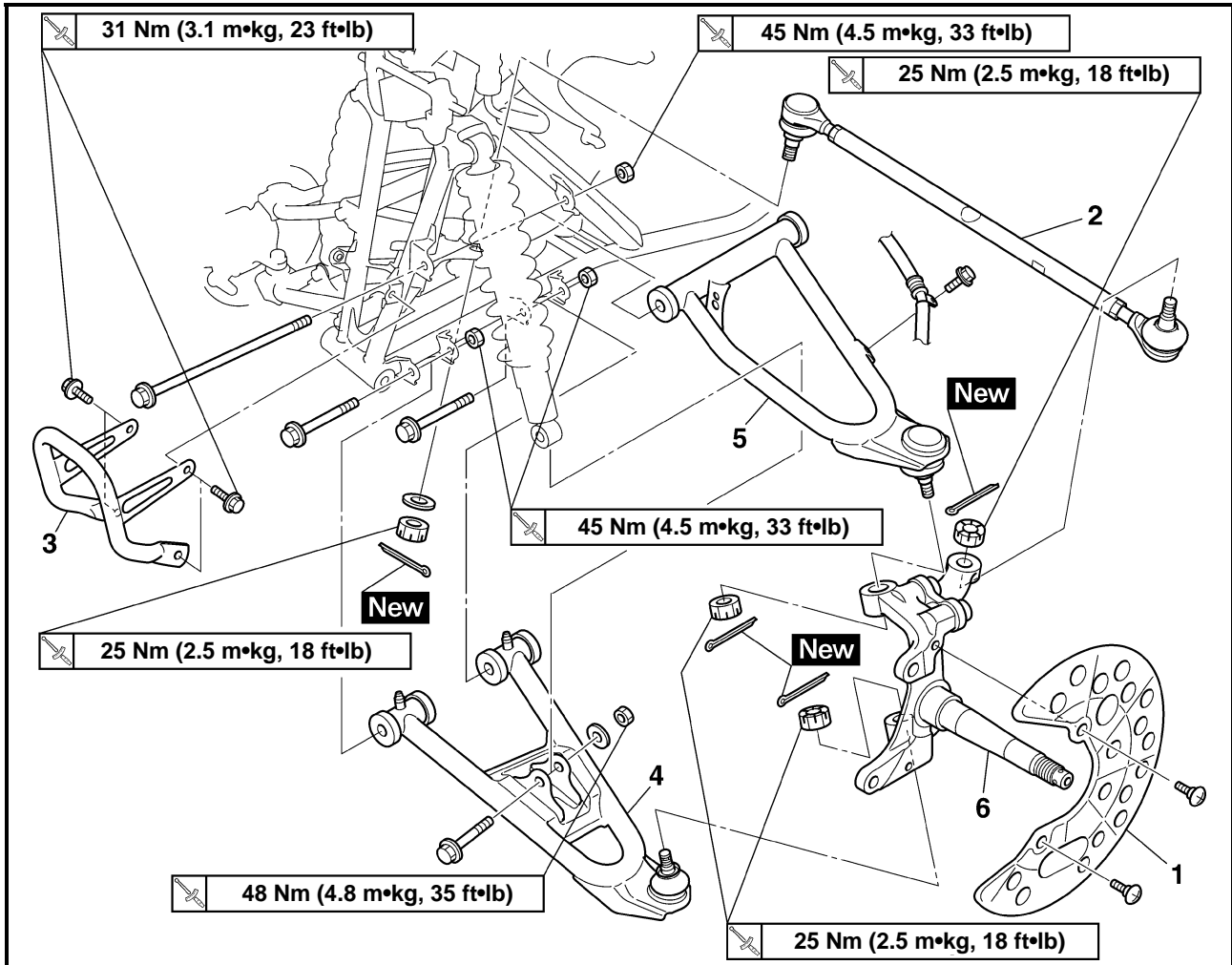
Bolt
23 Nm (2.3 m•kg, 17 ft•lb)

2. Bend the lock washer tab along a flat side of the bolt.

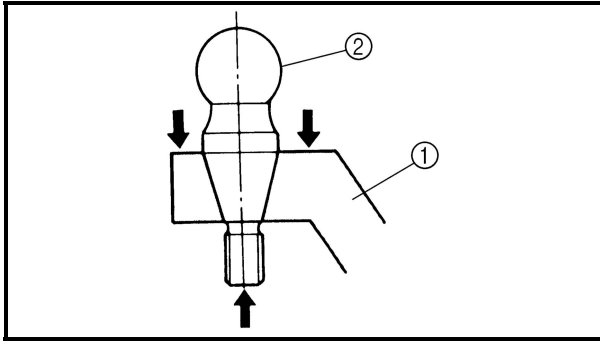


EBS00460

TIE-RODS AND STEERING KNUCKLES



Order	Job/Part	Q'ty	Remarks
	Removing the tie-rods and steering knuckles		Remove the parts in the order listed.
	Front wheel/brake disc		The following procedure applies to both of the tie-rods and steering knuckles. Refer to "FRONT AND REAR WHEELS". Refer to "FRONT AND REAR BRAKES".
	Front brake caliper		
1	Brake disc guard (inner)	1	
2	Tie-rod	1	Refer to "INSTALLING THE TIE-RODS".
3	Front bumper	1	
4	Lower front arm	1	
5	Upper front arm	1	
6	Steering knuckle	1	Refer to "REMOVING THE STEERING KNUCKLES". For installation, reverse the removal procedure.



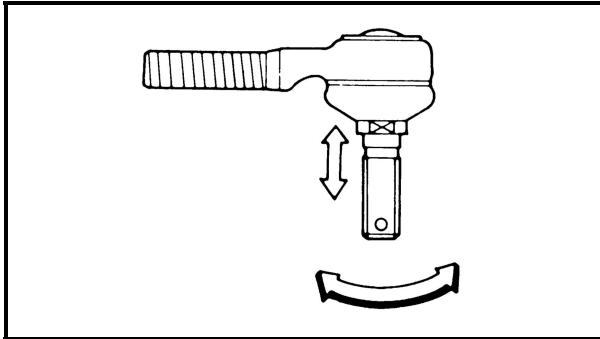
EBS00461

REMOVING THE STEERING KNUCKLES

1. Remove:
 - steering knuckles ①

NOTE: _____

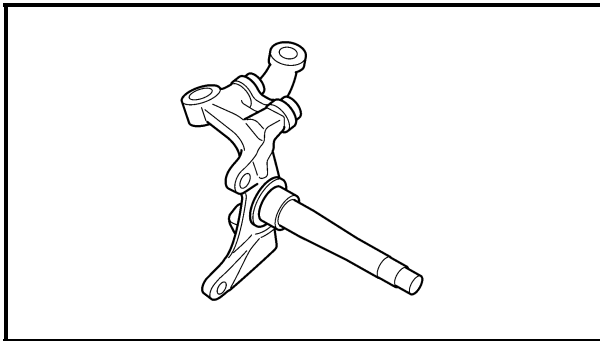
Use a general puller to separate the ball joint ② and steering knuckle.



EBS00462

CHECKING THE TIE-RODS

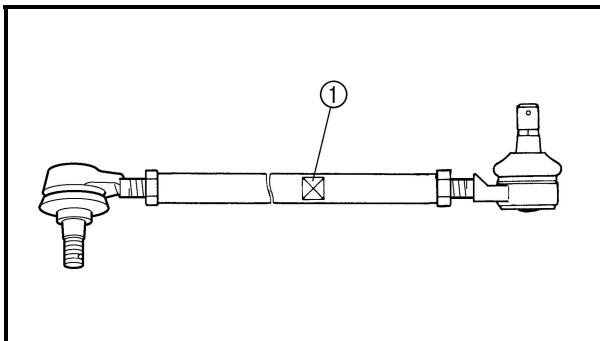
1. Check:
 - tie-rod free play and movement
Free play → Replace the tie-rod end.
Turns roughly → Replace the tie-rod end.
2. Check:
 - tie-rods
Bends/damage → Replace.



EBS00464

CHECKING THE STEERING KNUCKLES

1. Check:
 - steering knuckles
Damage/pitting → Replace.



EBS00465

INSTALLING THE TIE-RODS

1. Install:
 - tie-rods (left and right)

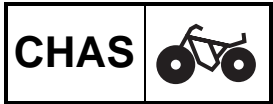


Ball joint nut
25 Nm (2.5 m•kg, 18 ft•lb)

NOTE: _____

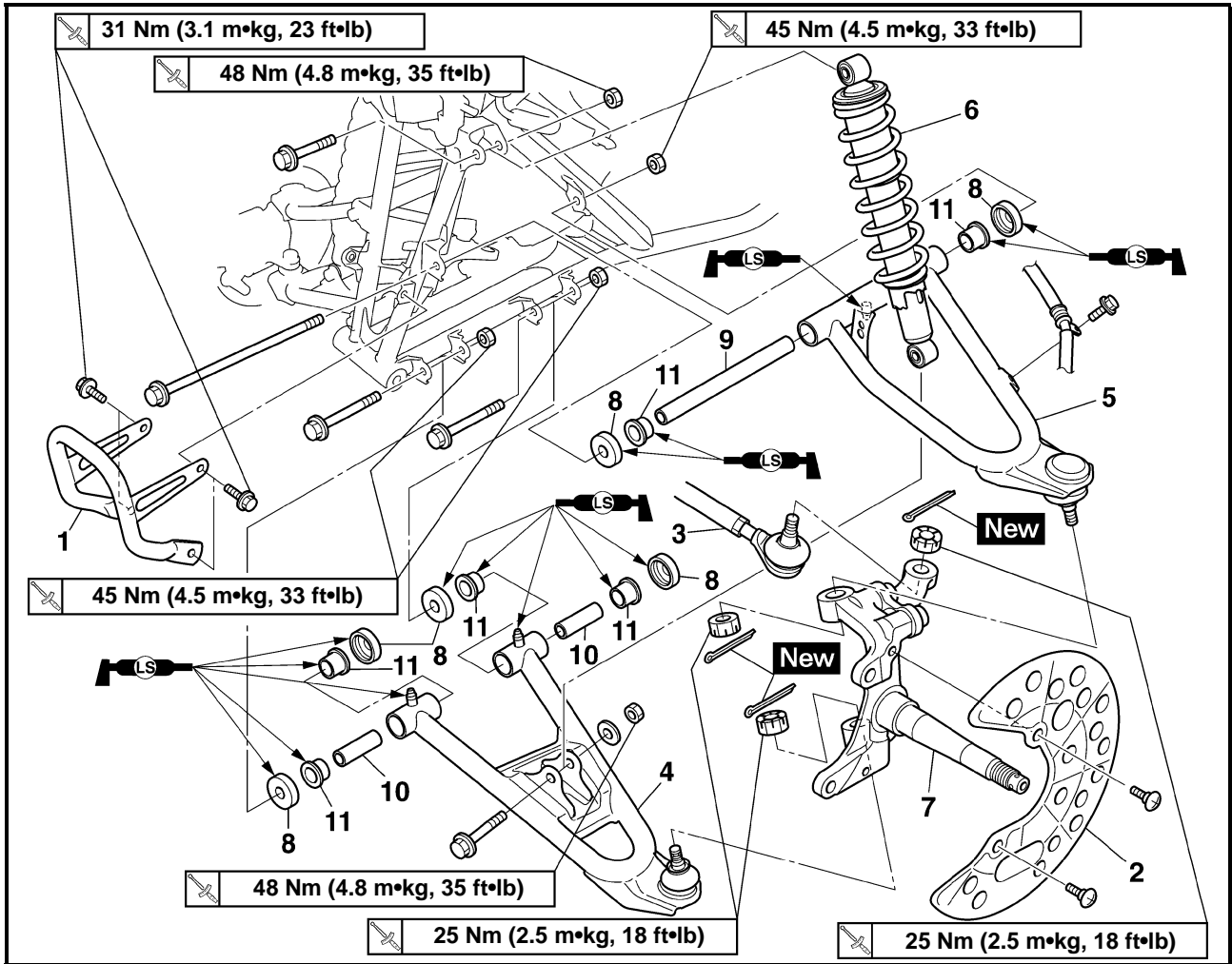
The tie-rod side which must be installed on the outside has grooves ①.

2. Adjust:
 - toe-in
Refer to “ADJUSTING THE TOE-IN” in chapter 3.



EBS00468

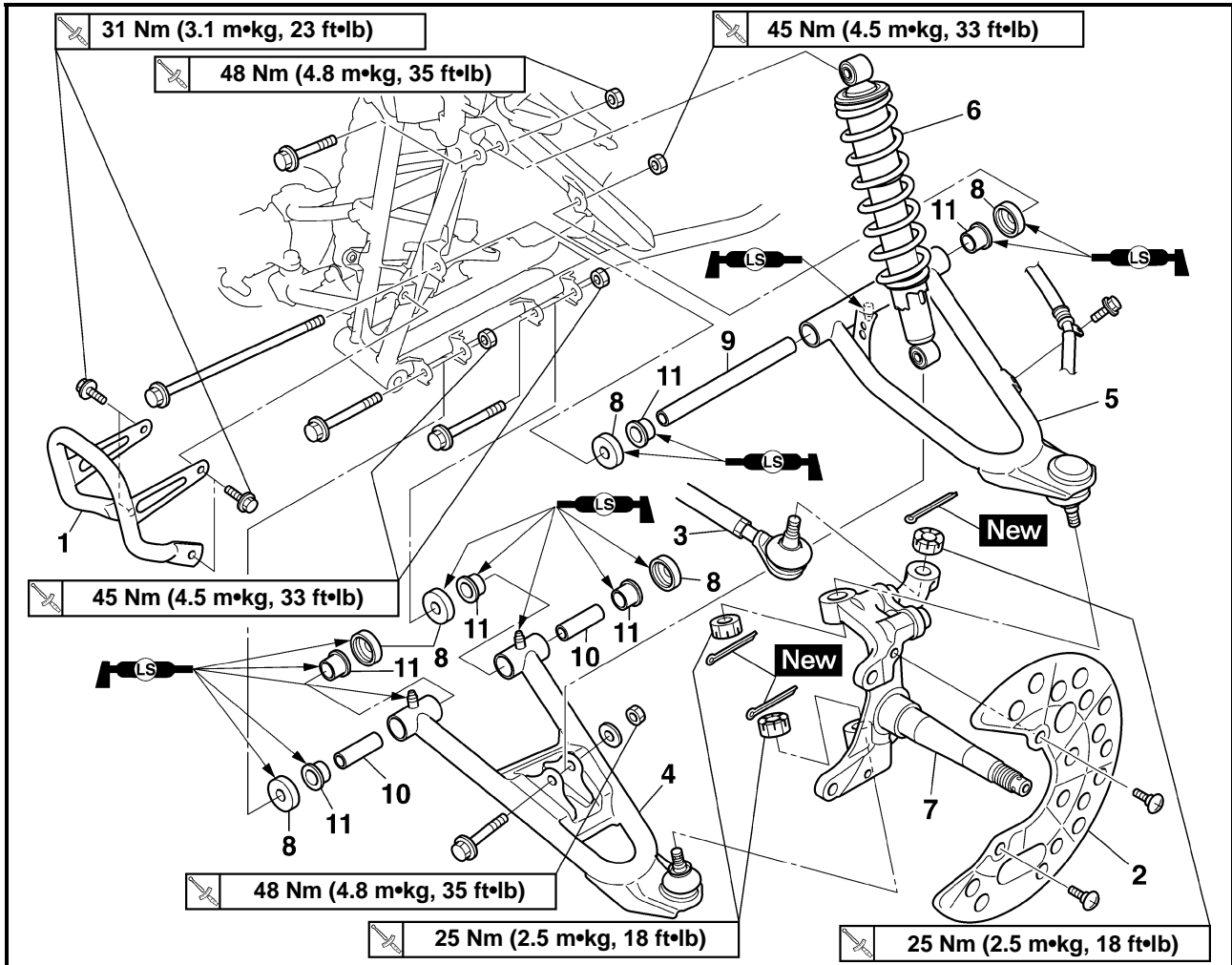
FRONT ARMS AND FRONT SHOCK ABSORBER ASSEMBLIES



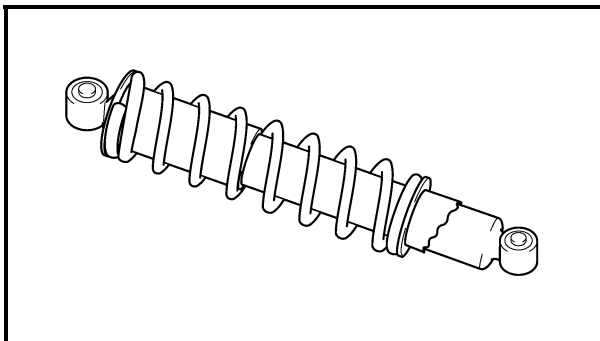
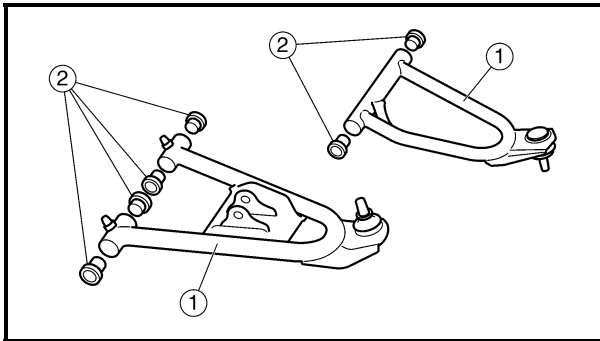
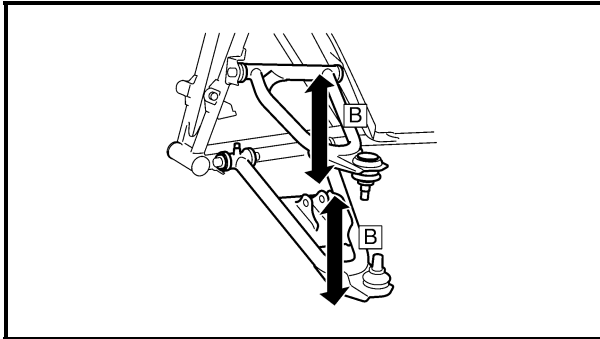
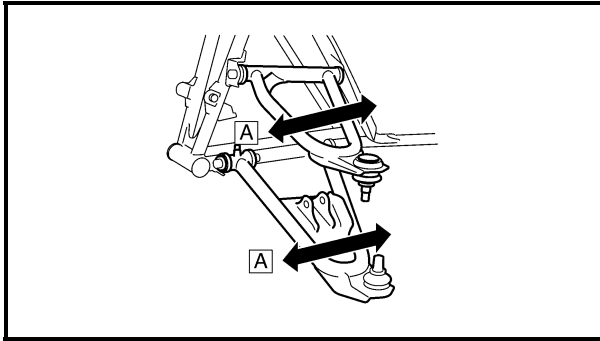
Order	Job/Part	Q'ty	Remarks
	Removing the front arms and front shock absorber assemblies		Remove the parts in the order listed.
	Front wheel/brake disc		The following procedure applies to both of the front arms and front shock absorber assemblies. Refer to "FRONT AND REAR WHEELS". Refer to "FRONT AND REAR BRAKES".
	Front brake caliper		
1	Front bumper	1	Disconnect. Refer to "REMOVING THE FRONT ARMS" and "INSTALLING THE FRONT ARMS".
2	Brake disc guard (inner)	1	
3	Tie-rod	1	
4	Lower front arm	1	
5	Upper front arm	1	
6	Front shock absorber	1	
7	Steering knuckle	1	

FRONT ARMS AND FRONT SHOCK ABSORBER ASSEMBLIES

CHAS



Order	Job/Part	Q'ty	Remarks
8	Dust cover	6	For installation, reverse the removal procedure.
9	Spacer	1	
10	Spacer	2	
11	Bushing	6	



EBS00469

REMOVING THE FRONT ARMS

1. Check:
 - front arm free play



- a. Check the front arm side play [A] by moving it from side to side.
If side play is noticeable, check the bushings.
- b. Check the front arm vertical movement [B] by moving it up and down.
If the vertical movement is tight or rough, or if there is binding, check the bushings.



2. Remove:
 - front arm

EBS00470

CHECKING THE FRONT ARMS

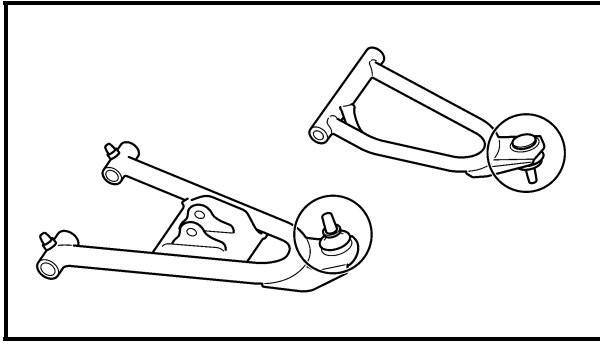
1. Check:
 - front arms ①
Bends/damage → Replace.
2. Check:
 - bushings ②
Wear/damage → Replace.

EBS00488

CHECKING THE FRONT SHOCK ABSORBERS

The following procedure applies to both of the front shock absorber assemblies.

1. Check:
 - shock absorber
Oil leaks → Replace the front shock absorber assembly.
 - shock absorber rod
Bends/damage → Replace the front shock absorber assembly.
 - spring
Fatigue → Replace the front shock absorber assembly.
Move the spring up and down.

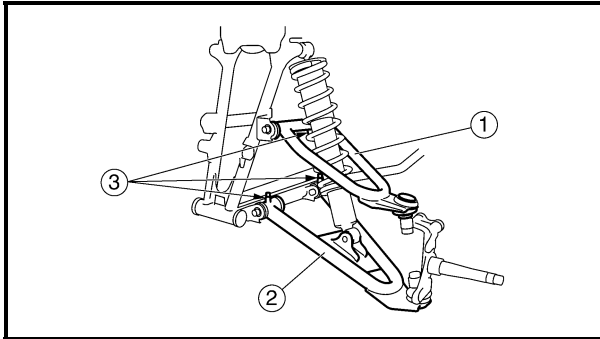


EBS00472

CHECKING THE BALL JOINTS

The following procedure applies to both of the front arm ball joints.

1. Check:
 - ball joint
Damage/pitting → Replace the front arm.
Free play → Replace the front arm.
Turns roughly → Replace the front arm.



EBS00473

INSTALLING THE FRONT ARMS

The following procedure applies to both of the front arms.

1. Install:
 - upper front arm ①
 - lower front arm ②



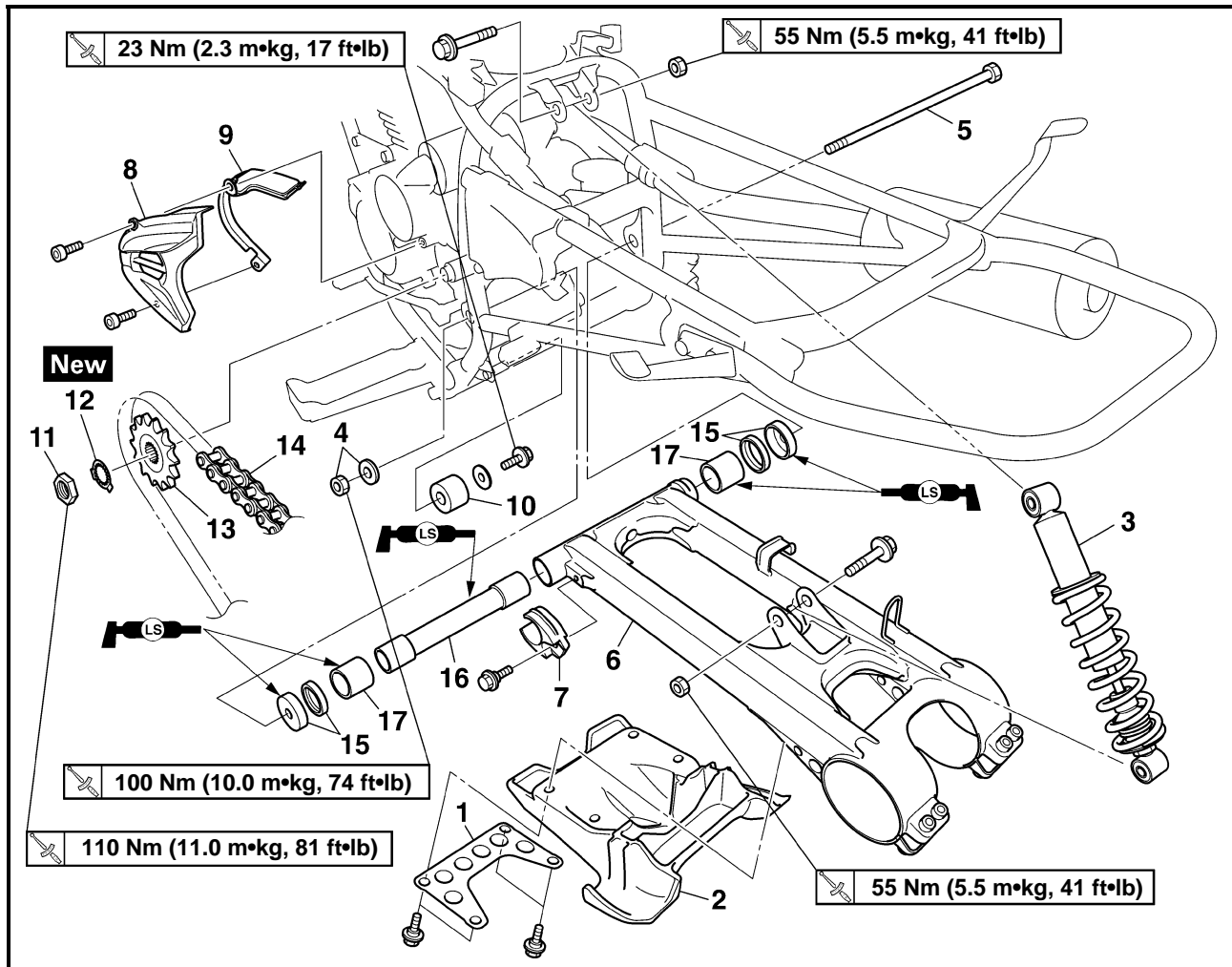
Front arm (upper, lower)
45 Nm (4.5 m•kg, 33 ft•lb)

NOTE:

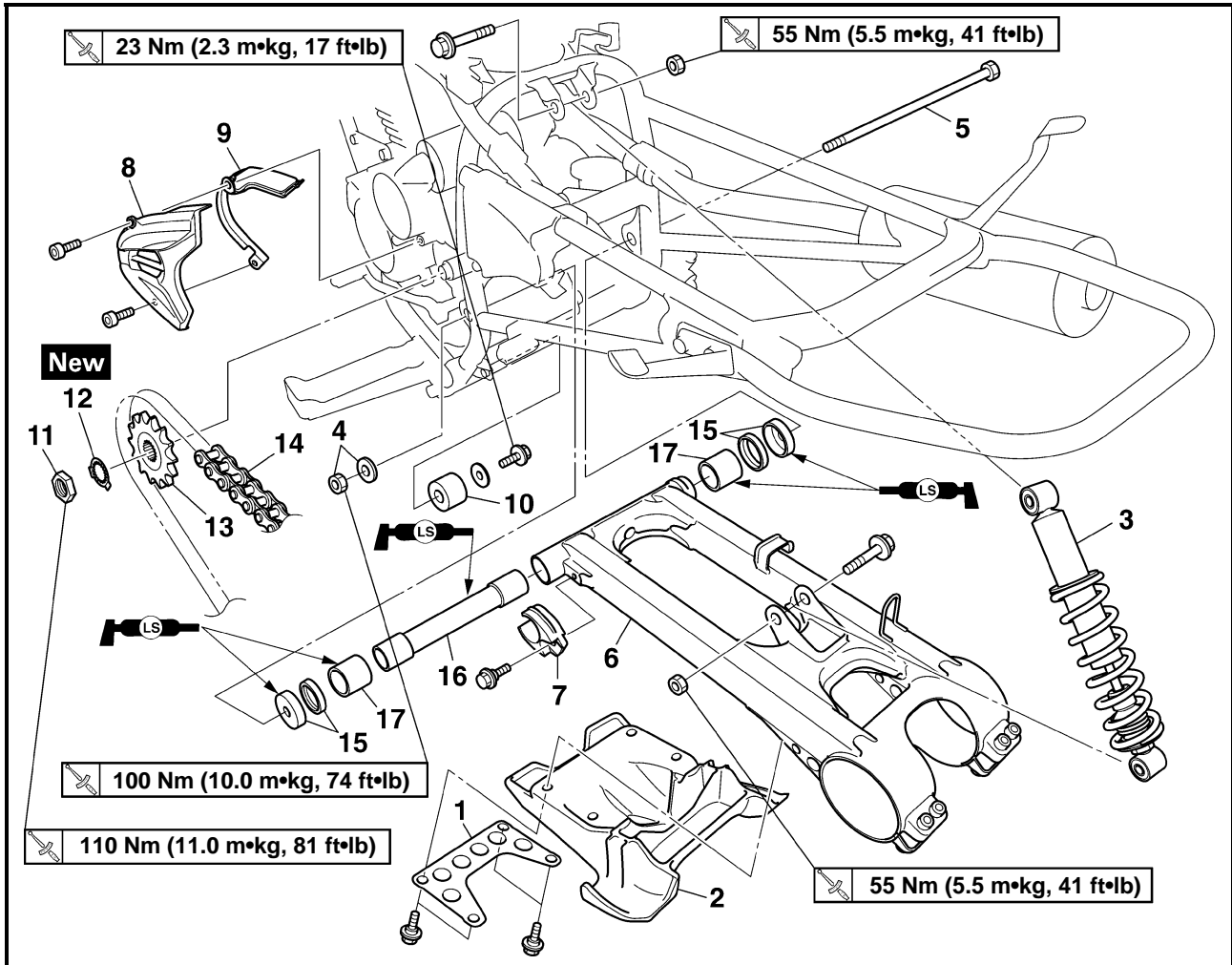
- Be sure to position the bolts (upper and lower) so that the bolt head faces forward.
- Apply lithium-soap-based grease to the grease nipple ③.



REAR SHOCK ABSORBER, SWINGARM AND DRIVE CHAIN



Order	Job/Part	Q'ty	Remarks
	Removing the rear shock absorber, swingarm and drive chain		Remove the parts in the order listed.
	Seat/rear fender/air filter case		Refer to "SEAT, FENDERS AND FUEL TANK" in chapter 3.
	Rear axle hub		Refer to "REAR AXLE AND REAR AXLE HUB".
1	Plate	1	
2	Swingarm end cover	1	
3	Rear shock absorber	1	
4	Pivot shaft nut/washer	1/1	
5	Pivot shaft	1	
6	Swingarm	1	
7	Drive chain guide 1	1	
8	Drive sprocket cover	1	



Order	Job/Part	Q'ty	Remarks
9	Drive chain guide 2	1	Refer to "INSTALLING THE DRIVE SPROCKET".
10	Drive chain guide 3	1	
11	Nut	1	
12	Lock washer	1	
13	Drive sprocket	1	
14	Drive chain	1	Refer to "INSTALLING THE SWINGARM". For installation, reverse the removal procedure.
15	Dust cover/oil seal	2/2	
16	Spacer	1	
17	Bearing	2	

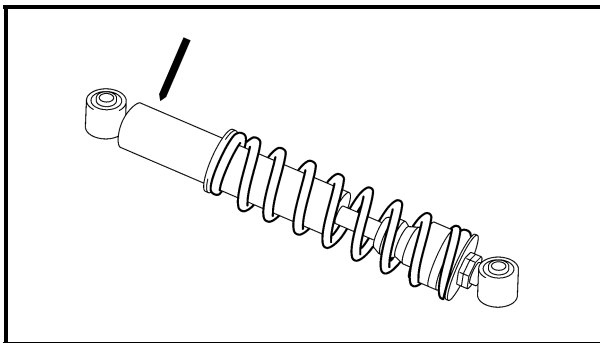


HANDLING THE REAR SHOCK ABSORBER

⚠ WARNING

This rear shock absorber contains highly compressed nitrogen gas. Before handling the rear shock absorber read and make sure you understand the following information. The manufacturer cannot be held responsible for property damage or personal injury that may result from improper handling of the rear shock absorber.

- Do not tamper or attempt to open the rear shock absorber.
- Do not subject the rear shock absorber to an open flame or any other source of high heat. High heat can cause an explosion due to excessive gas pressure.
- Do not deform or damage the rear shock absorber in any way. If the rear shock absorber is damaged, damping performance will suffer.



DISPOSING OF A REAR SHOCK ABSORBER

Gas pressure must be released before disposing of a rear shock absorber. To release the gas pressure, drill a 2 ~ 3 mm (0.08 ~ 0.12 in) hole through the rear shock absorber at point 15 ~ 20 mm (0.59 ~ 0.79 in) from its end as shown.

⚠ WARNING

Wear eye protection to prevent eye damage from released gas or metal chips.



EBS00487

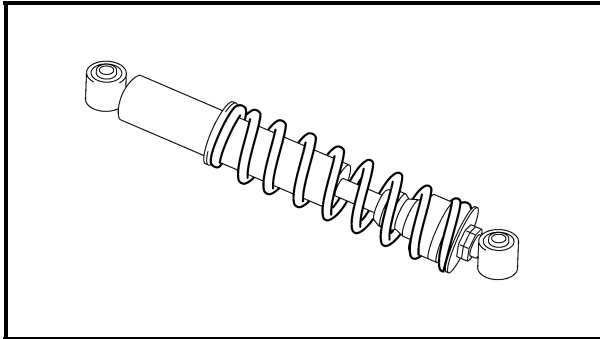
REMOVING THE REAR SHOCK ABSORBER

1. Remove:

- rear shock absorber lower bolt
- rear shock absorber upper bolt

NOTE: _____

While removing the rear shock absorber lower bolt, hold the swingarm so that it does not drop down.



EBS00488

CHECKING THE REAR SHOCK ABSORBER

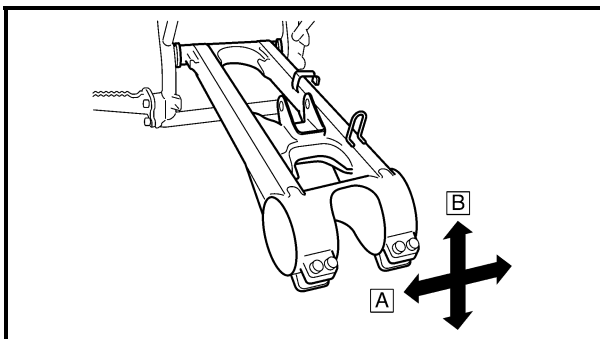
1. Check:

- shock absorber
Gas leaks/oil leaks → Replace the rear shock absorber assembly.
- shock absorber rod
Bends/damage → Replace the rear shock absorber assembly.
- spring
Fatigue → Replace the rear shock absorber assembly.
Move the spring up and down.

EBS00493

NOTE: _____

Before removing the drive chain and the sprockets, measure the drive chain slack and a 15-link section of the drive chain.




EBS00494

REMOVING THE SWINGARM

1. Check:

- swingarm free play



- a. Check the tightening torque of the pivot shaft nut.  **100 Nm (10.0 m•kg, 74 ft•lb)**

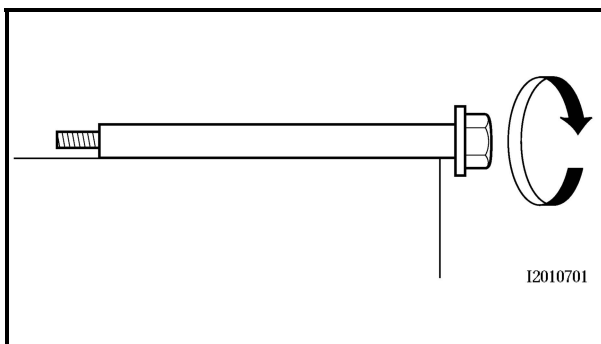
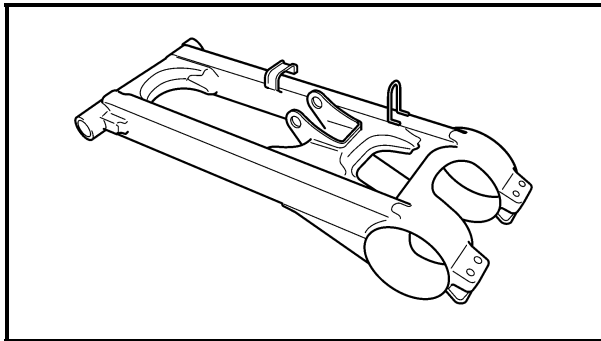


**Swingarm free play limit
(at the end of the swingarm)
1.0 mm (0.04 in)**

- b. Check the swingarm side play [A] by moving it from side to side.
If side play is noticeable, check the spacer, bearings and frame pivot.
- c. Check the swingarm vertical movement [B] by moving it up and down.
If vertical movement is tight or rough, or if there is binding, check the spacer, bearings and frame pivot.



2. Remove:
 - pivot shaft nut
 - washer
 - pivot shaft
 - swingarm



EBS00495

CHECKING THE SWINGARM

1. Check:
 - swingarm
Bends/cracks/damage → Replace.
2. Check:
 - pivot shaft
Roll the axle on a flat surface.
Bends → Replace.

⚠ WARNING

Do not attempt to straighten a bent pivot shaft.

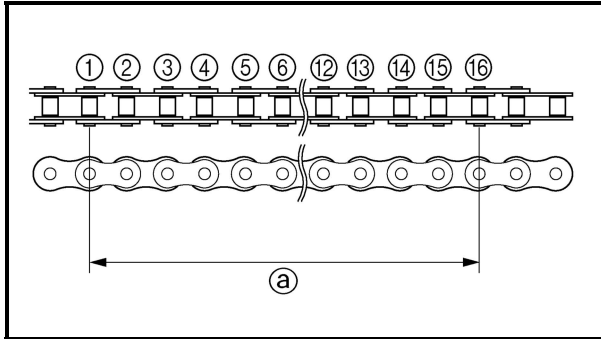
3. Clean:
 - pivot shaft
 - spacer
 - bearings



**Recommended cleaning solvent
Kerosene**



4. Check:
- oil seals
Damage/wear → Replace.
 - bearings
Damage/pitting → Replace.



EBS00496

CHECKING THE DRIVE CHAIN

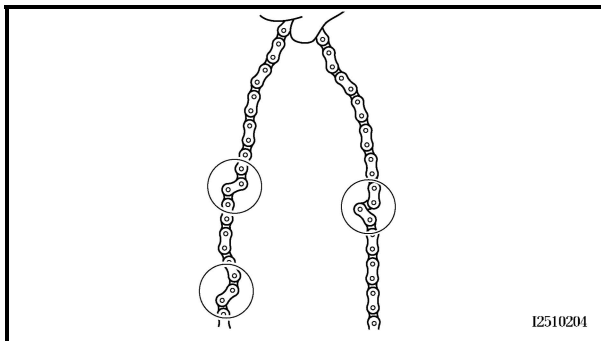
1. Measure:
- 15-link section (a) of the drive chain
Out of specification → Replace the drive chain.



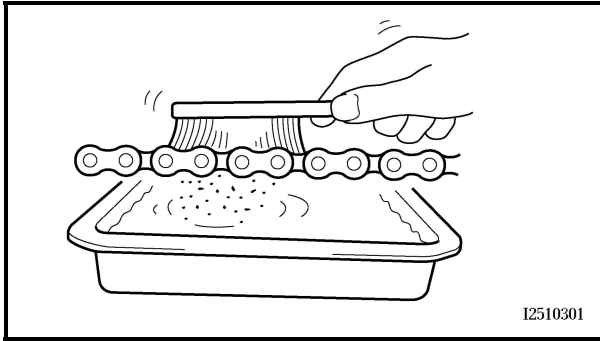
**15-link drive chain section limit
(maximum)
239.3 mm (9.42 in)**

NOTE:

- While measuring the 15-link section, push down on the drive chain to increase its tension.
- Measure the length between drive chain roller ① and ⑯ as shown.
- Perform this measurement at two or three different places.



2. Check:
- drive chain
Stiffness → Clean and lubricate or replace.



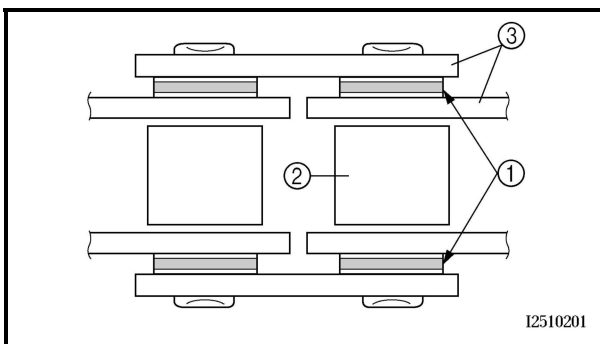
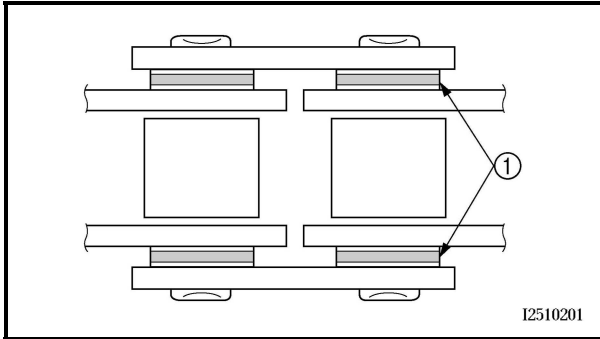
3. Clean:
 - drive chain



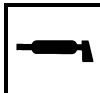
- a. Wipe the drive chain with a clean cloth.
- b. Put the drive chain in kerosene and remove any remaining dirt.
- c. Remove the drive chain from the kerosene and completely dry it.

CAUTION:

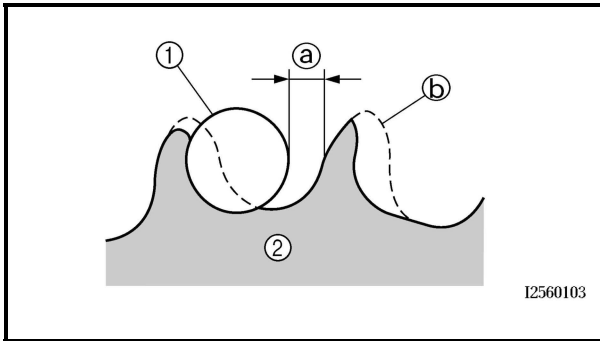
This machine has a drive chain with small rubber O-rings ① between the drive chain side plates. Never use high-pressure water or air, steam, gasoline, certain solvents (e.g., benzine), or a coarse brush to clean the drive chain. High-pressure methods could force dirt or water into the drive chain's internal parts, and solvents will deteriorate the O-rings. A coarse brush can also damage the O-rings. Therefore, use only kerosene to clean the drive chain. Don't soak the drive chain in kerosene for more than ten minutes. Kerosene will damage the O-rings.



4. Check:
 - O-rings ①
Damage → Replace the drive chain.
 - drive chain rollers ②
Damage/wear → Replace the drive chain.
 - drive chain side plates ③
Cracks/damage/wear → Replace the drive chain.
5. Lubricate:
 - drive chain



Recommended lubricant
 Engine oil or chain lubricant
 suitable for O-ring chains



I2560103

6. Check:

- drive sprocket
- driven sprocket

More than 1/4 tooth (a) wear → Replace the drive chain sprockets as a set.

Bent teeth → Replace the drive chain sprockets as a set.

- (b) Correct
- (1) Drive chain roller
- (2) Drive chain sprocket

EBS00497

INSTALLING THE SWINGARM

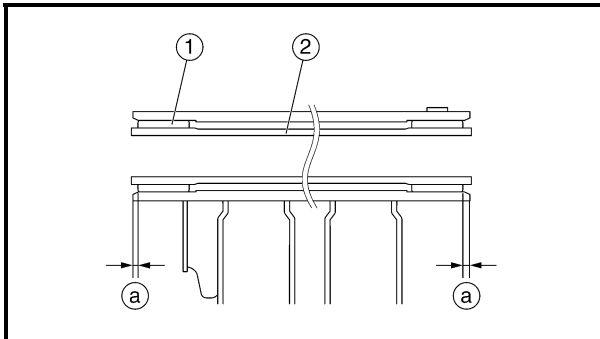
1. Install:

- bearings (1)
- spacer (2)

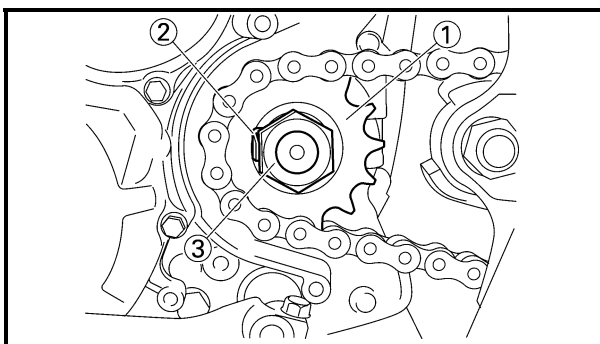
NOTE:

• Inject the bearing with the character stamp turned outward. Apply the lithium-soap-based grease to inside.

• Apply the lithium-soap-based grease on the spacer when installing.



Installed depth of bearing (a)
1 ~ 2 mm (0.04 ~ 0.08 in)



EBS00498

INSTALLING THE DRIVE SPROCKET

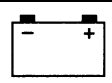
1. Install:

- drive sprocket (1)
- lock washer (2) **New**
- nut (3)



Drive sprocket nut
110 Nm (11.0 m•kg, 81 ft•lb)

2. Bend the lock washer tab along a flat side of the nut.

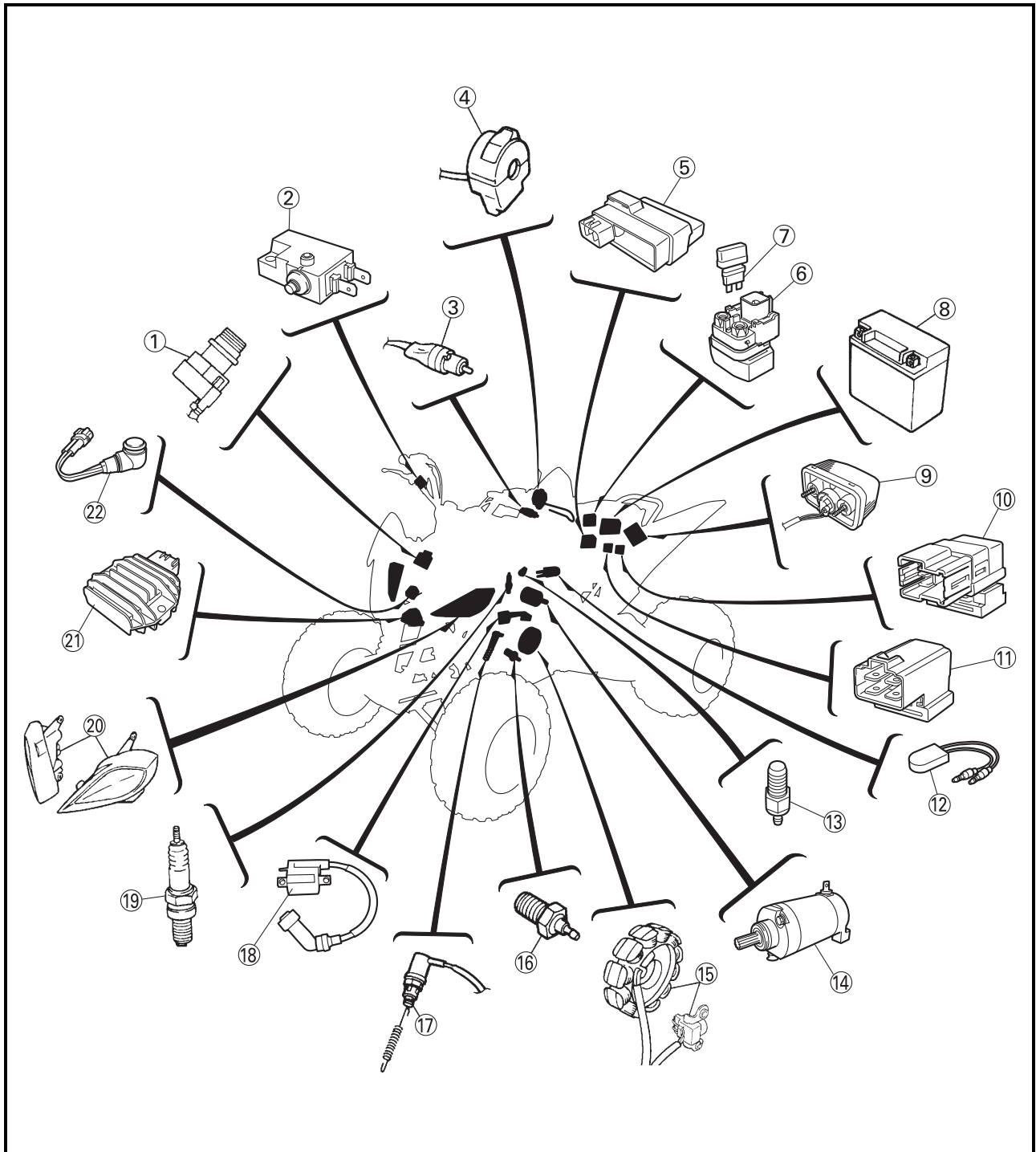


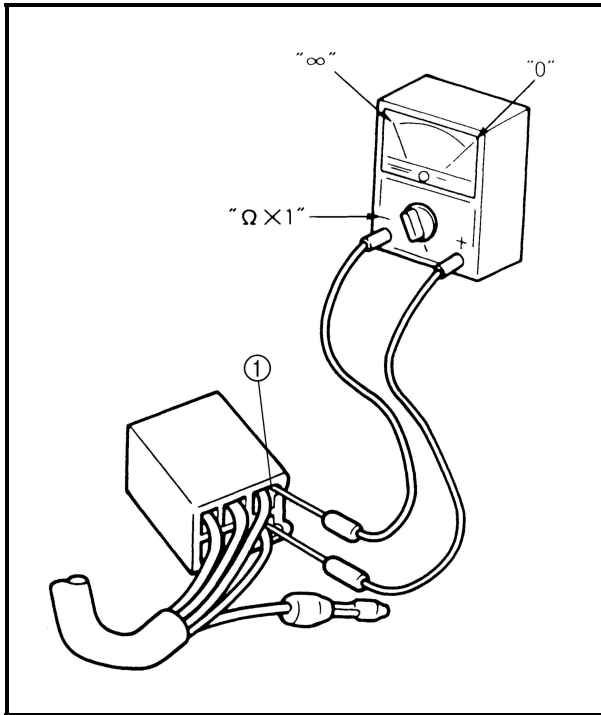
EBS00500

ELECTRICAL

ELECTRICAL COMPONENTS

- | | | | |
|----------------------------|----------------------------------|-------------------------------|---------------------------|
| ① Main switch | ⑨ Tail/brake light | ⑮ Pickup coil/stator assembly | ⑳ Rectifier/regulator |
| ② Front brake light switch | ⑩ Headlight relay | ⑯ Neutral switch | ㉑ Neutral indicator light |
| ③ Clutch switch | ⑪ Starting circuit cut-off relay | ⑰ Rear brake light switch | |
| ④ Handlebar switch | ⑫ Thermo switch | ⑱ Ignition coil | |
| ⑤ CDI unit | ⑬ Carburetor warmer | ⑲ Spark plug | |
| ⑥ Starter relay | ⑭ Starter motor | ⑳ Headlight | |
| ⑦ Fuse | | | |
| ⑧ Battery | | | |





EBS01028

CHECKING SWITCH CONTINUITY

Check each switch for continuity with the pocket tester. If the continuity reading is incorrect, check the wiring connections and if necessary, replace the switch.

CAUTION:

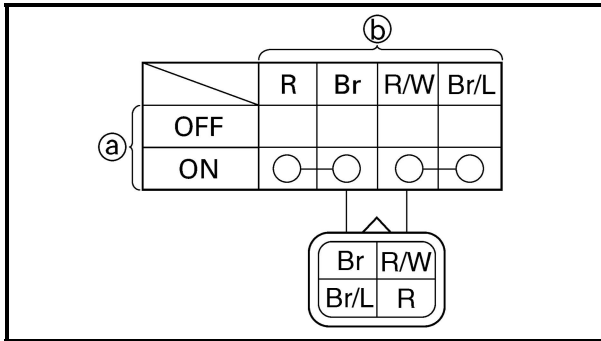
Never insert the tester probes into the coupler terminal slots ①. Always insert the probes from the opposite end of the coupler, taking care not to loosen or damage the leads.



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

NOTE:

- Before checking for continuity, set the pocket tester to “0” and to the “Ω × 1” range.
- When checking for continuity, switch back and forth between the switch positions a few times.



The terminal connections for switches (e.g., main switch, engine stop switch) are shown in an illustration similar to the one on the left. The switch positions (a) are shown in the far left column and the switch lead colors (b) are shown in the top row in the switch illustration.

NOTE:

“○—○” indicates a continuity of electricity between switch terminals (i.e., a closed circuit at the respective switch position).

The example illustration on the left shows that:

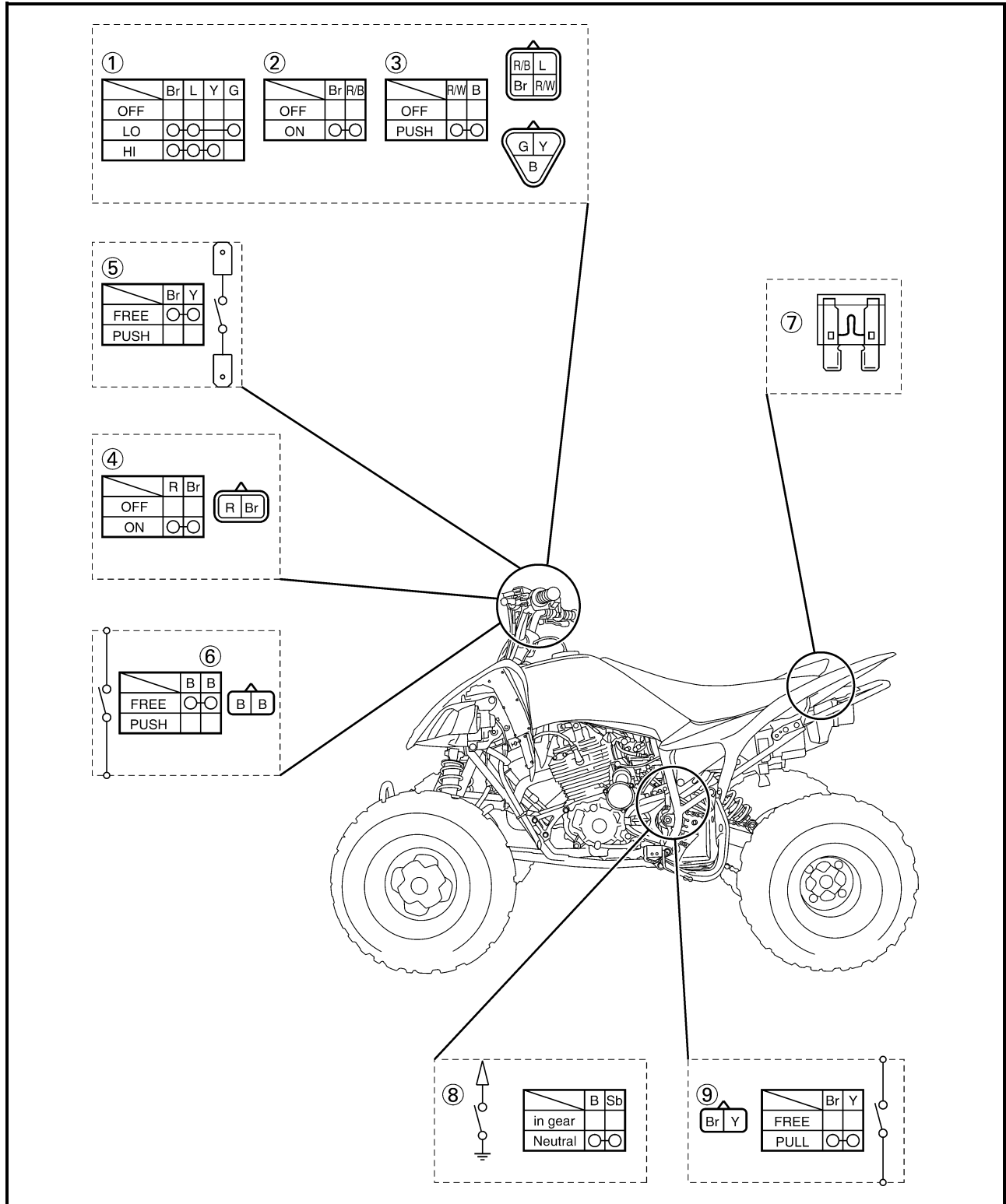
There is continuity between the switch terminals for the red and brown switch leads and between the switch terminals for the red/white and brown/blue switch leads when the switch is set to “ON”.

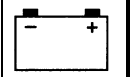
EBS01029

CHECKING THE SWITCHES

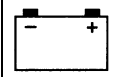
Check each switch for damage or wear, proper connections, and also for continuity between the terminals. Refer to "CHECKING SWITCH CONTINUITY".

- Damage/wear → Repair or replace.
- Improperly connected → Properly connect.
- Incorrect continuity reading → Replace the switch.





- ① Light switch
- ② Engine stop switch
- ③ Start switch
- ④ Main switch
- ⑤ Front brake light switch
- ⑥ Clutch switch
- ⑦ Fuse
- ⑧ Neutral switch
- ⑨ Rear brake light switch



EBS01030

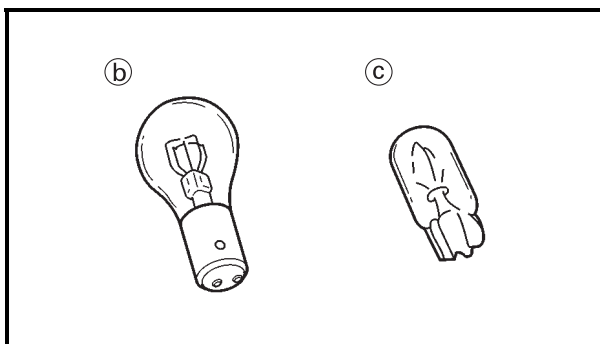
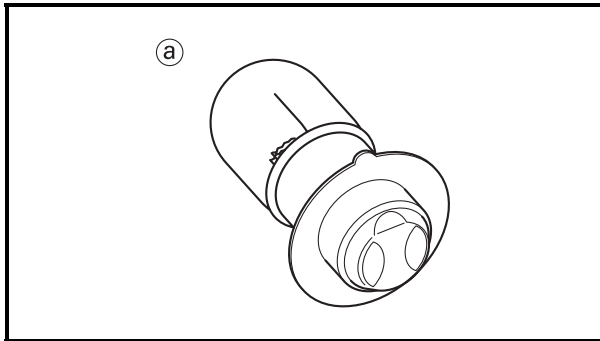
CHECKING THE BULBS AND BULB SOCKETS

Check each bulb and bulb socket for damage or wear, proper connections, and also for continuity between the terminals.

Damage/wear → Repair or replace the bulb, bulb socket or both.

Improperly connected → Properly connect.

No continuity → Repair or replace the bulb, bulb socket or both.



TYPES OF BULBS

The bulbs used on this machine are shown in the illustration on the left.

- Bulb (a) is used for the headlight and can be pulled out by turning counterclockwise while pushing the bulb holder and removing.

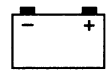
After this, you can remove the bulb.

- Bulb (b) is used for tail/ brake lights and can be removed from the socket by pushing and turning the bulb counterclockwise.
- Bulb (c) is used for indicator lights and can be removed from their respective socket by carefully pulling them out.

CHECKING THE CONDITION OF THE BULBS

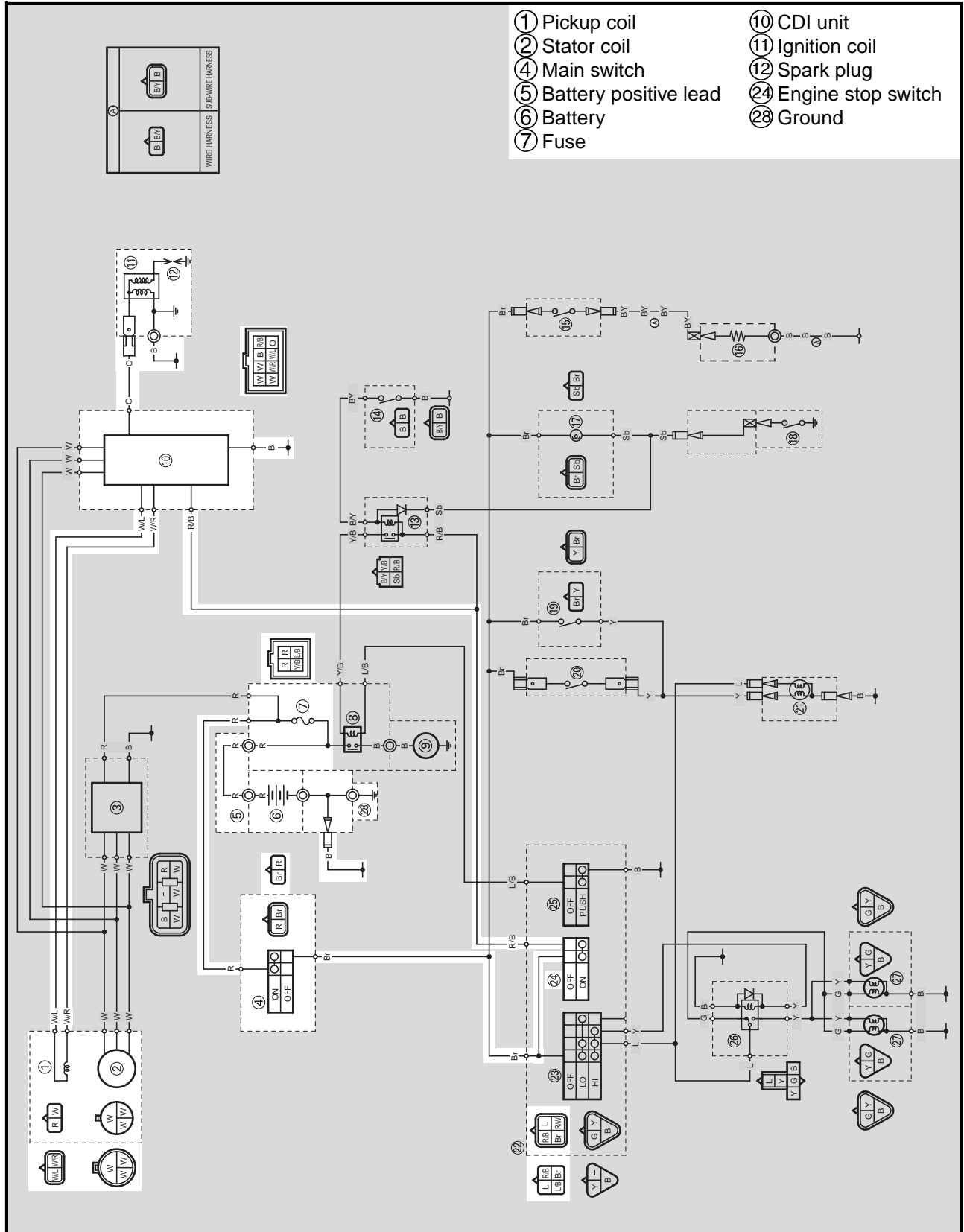
The following procedure applies to all of the bulbs.

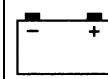
1. Remove:
 - bulb



EBS00503

IGNITION SYSTEM CIRCUIT DIAGRAM





EBS01045

TROUBLESHOOTING


The ignition system fails to operate (no spark or intermittent spark).

Check:

1. fuse
2. battery
3. spark plug
4. ignition spark gap
5. ignition coil resistance
6. main switch
7. engine stop switch
8. pickup coil resistance
9. wiring connections (of the entire ignition system)

NOTE:

- Before troubleshooting, remove the following part(s):
 1. seat
 2. front panel
 3. front fender
 4. rear fender
 5. side cover
- Troubleshoot with the following special tool(s).

	<p>Ignition checker 90890-06754</p> <p>Opama pet-4000 spark checker YM-34487</p> <p>Pocket tester 90890-03112</p> <p>Analog pocket tester YU-03112-C</p>
---	--

EBS01043


<p>1. Fuse</p> <ul style="list-style-type: none"> • Check the fuse for continuity. Refer to "CHECKING THE SWITCHES". • Is the fuse OK?

↓ YES

↓ NO

Replace the fuse.

EBS01044


2. Battery	
<ul style="list-style-type: none"> • Check the condition of the battery. Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3. 	
	<p>Minimum open-circuit voltage 12.8 V or more at 20°C (68°F)</p>
<ul style="list-style-type: none"> • Is the battery OK? 	

↓ YES

↓ NO

• Clean the battery terminals.
• Recharge or replace the battery.

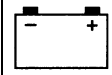
EBS01032

3. Spark plug	
<ul style="list-style-type: none"> • Check the condition of the spark plug. • Check the spark plug type. • Measure the spark plug gap. Refer to "CHECKING THE SPARK PLUG" in chapter 3. 	
	<p>Standard spark plug DR7EA (NGK)</p> <p>Spark plug gap 0.6 ~ 0.7 mm (0.024 ~ 0.028 in)</p>
<ul style="list-style-type: none"> • Is the spark plug in good condition, is it of the correct type, and is its gap within specification? 	

↓ YES

↓ NO

Re-gap or replace the spark plug.

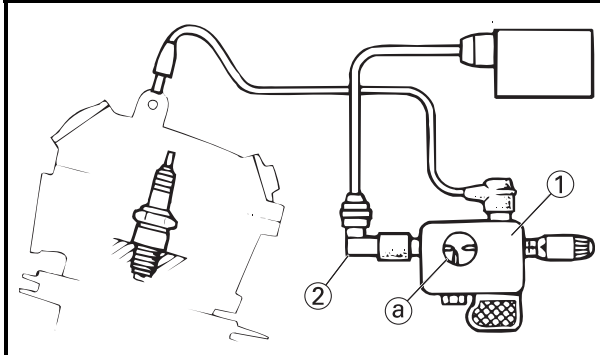


EBS01034

4. Ignition spark gap

The following procedure applies to all of the spark plugs.

- Disconnect the spark plug cap from the spark plug.
- Connect the ignition checker ① and spark plug cap ② as shown.
- Set the main switch to "ON".
- Measure the ignition spark gap ③.
- Crank the engine by pushing the starter switch and gradually increase the spark gap until a misfire occurs.



Minimum ignition spark gap
6 mm (0.24 in)

- Is there a spark and is the spark gap within specification?

↓ NO

↓ YES

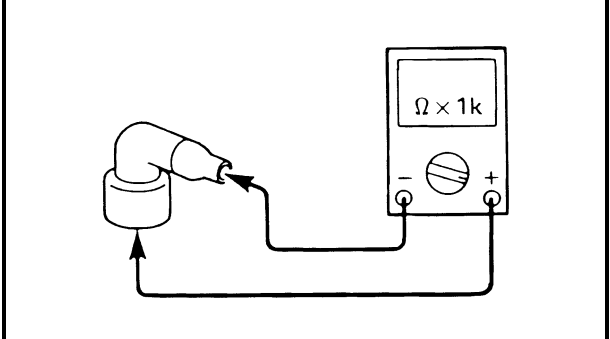
The ignition system is OK.

EAS00745

5. Spark plug cap resistance

The following procedure applies to all of the spark plug caps.

- Remove the spark plug cap from the spark plug lead.
- Connect the pocket tester ($\Omega \times 1k$) to the spark plug cap as shown.
- Measure the spark plug cap resistance.



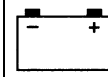
Spark plug cap resistance
10 k Ω at 20°C (68°F)

- Is the spark plug cap OK?

↓ YES

↓ NO

Replace the spark plug cap.



EBS01038

6. Ignition coil resistance

- Disconnect the ignition coil coupler from the ignition coil.
- Connect the pocket tester ($\Omega \times 1$) to the ignition coil as shown.

Positive tester probe → orange lead terminal ①
Negative tester probe → ignition coil base ②

- Measure the primary coil resistance.

Primary coil resistance
 0.18 ~ 0.28 Ω at 20°C (68°F)

- Connect the pocket tester ($\Omega \times 1k$) to the ignition coil as shown.

Positive tester probe → high tension code ①
Negative tester probe → orange lead terminal ②

- Measure the secondary coil resistance.

Secondary coil resistance
 6.32 ~ 9.48 k Ω at 20°C (68°F)

- Is the ignition coil OK?

↓ YES

↓ NO

Replace the ignition coil.

EBS01041

7. Main switch

- Check the main switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the main switch OK?

↓ YES ↓ NO

Replace the main switch.

EBS01042

8. Engine stop switch

- Check the engine stop switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the engine stop switch OK?

↓ YES ↓ NO

Replace the handle-bar switch.

EBS01040

9. Pickup coil resistance

- Disconnect the pickup coil coupler from the wire harness.
- Connect the pocket tester ($\Omega \times 100$) to the pickup coil terminal as shown.

Positive tester probe → red terminal ①
Negative tester probe → white terminal ②

- Measure the pickup coil resistance.

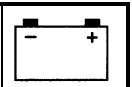
Pickup coil resistance
 248 ~ 372 Ω at 20°C (68°F)

- Is the pickup coil OK?

↓ YES

↓ NO

Replace the pickup coil/stator assembly.



EBS01047

10. Wiring

- Check the entire ignition system's wiring. Refer to "CIRCUIT DIAGRAM".
- Is the ignition system's wiring properly connected and without defects?



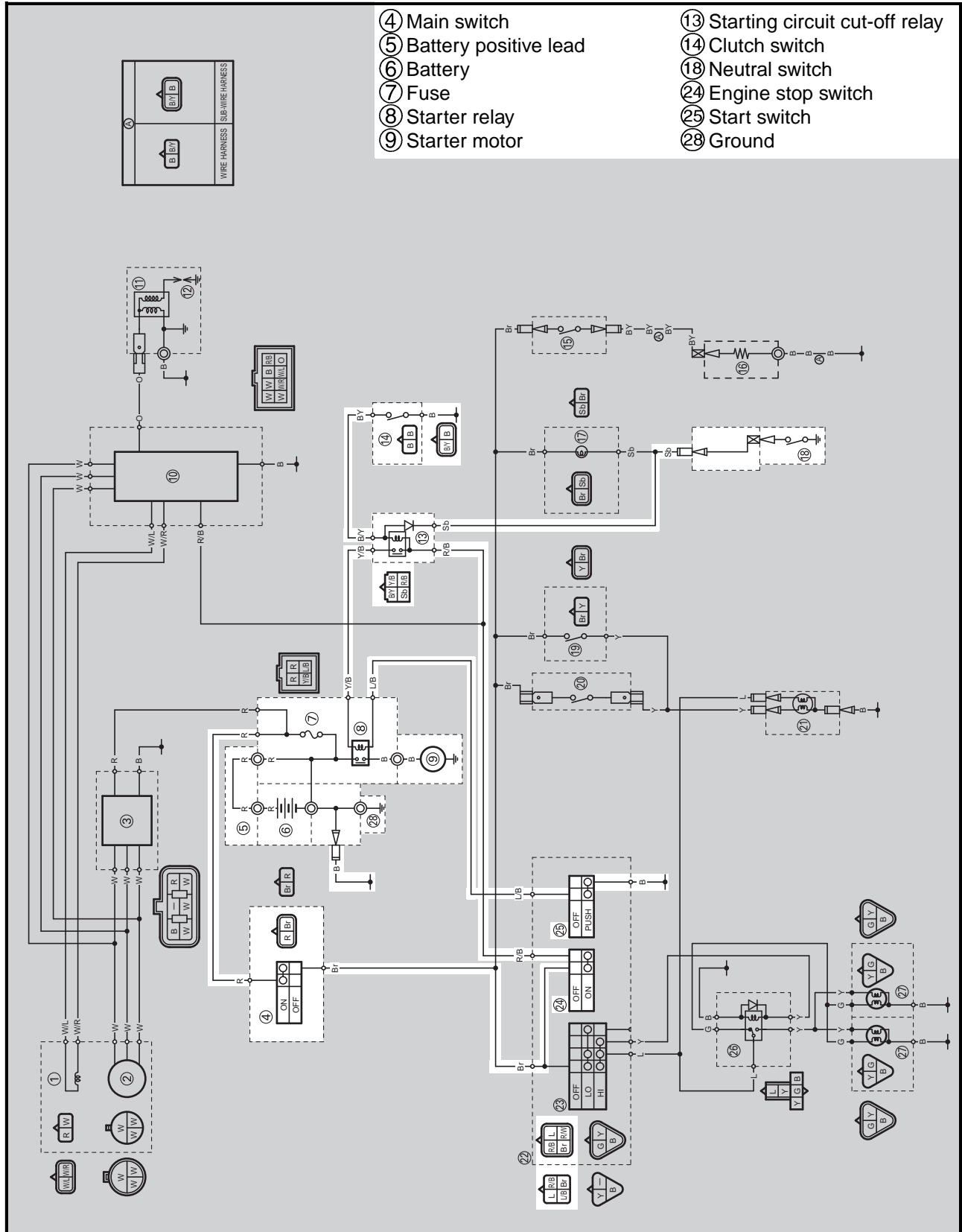
Replace the CDI unit.

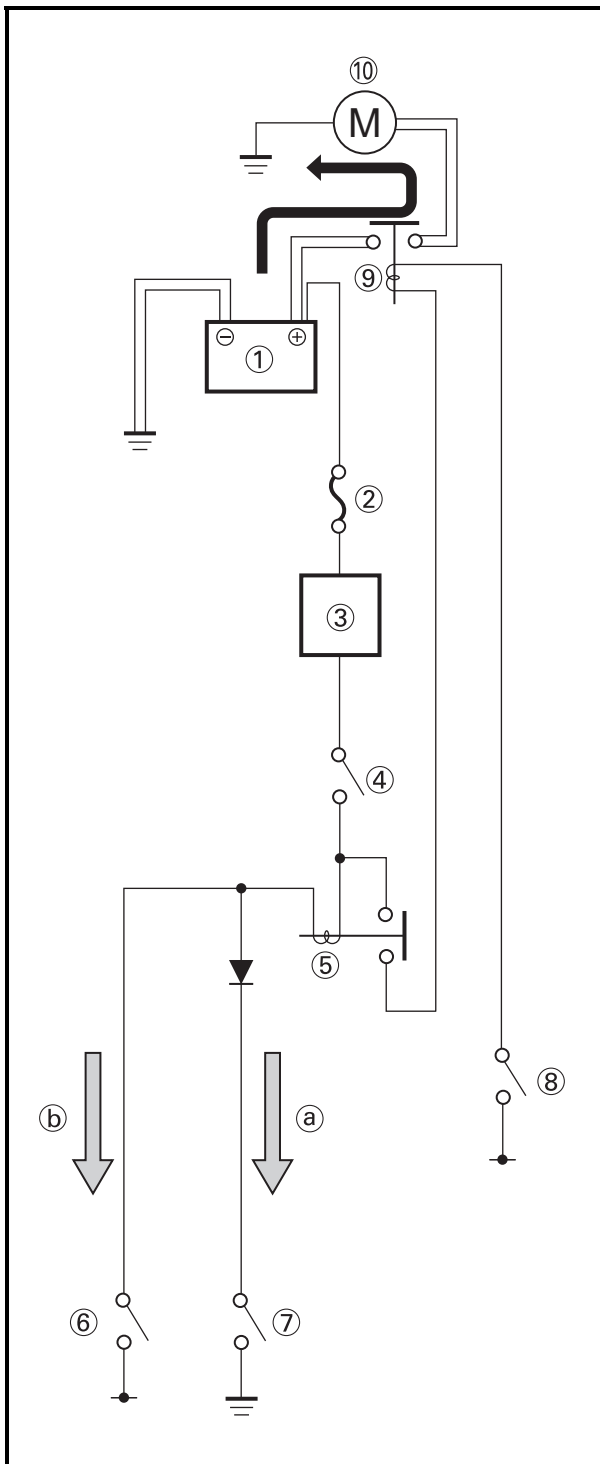
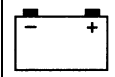


Properly connect or repair the ignition system's wiring.

EBS00506

**ELECTRIC STARTING SYSTEM
CIRCUIT DIAGRAM**





EBS00508

STARTING CIRCUIT CUT-OFF SYSTEM OPERATION

The starting circuit on this model consists of the starter motor, starter relay, clutch switch, and neutral switch. If the main switch is on and the engine stop switch is in the RUN position, the starter motor can be operated only if:

- (a) The transmission is in neutral (the neutral switch is closed)

or

- (b) You pull in the clutch lever (the clutch switch is closed).

- ① Battery
- ② Fuse
- ③ Main switch
- ④ Engine stop switch
- ⑤ Starting circuit cut-off relay
- ⑥ Clutch switch
- ⑦ Neutral switch
- ⑧ Start switch
- ⑨ Starter relay
- ⑩ Starter motor

EBS01050

TROUBLESHOOTING

The starter motor fails to turn.

Check:

1. fuse
2. battery
3. starter motor
4. starting circuit cut-off relay
5. starting circuit cut-off relay (diode)
6. starter relay
7. main switch
8. engine stop switch
9. neutral switch
10. clutch switch
11. start switch
12. wiring connections
(of the entire starting system)

NOTE:

- Before troubleshooting, remove the following part(s):
 1. seat
 2. front panel
 3. front fender
 4. rear fender
 5. side cover
- Troubleshoot with the following special tool(s).

Pocket tester
90890-03112, YU-03112-C

EBS01043

1. Fuse

- Check the fuse for continuity. Refer to "CHECKING THE SWITCHES".
- Is the fuse OK?

↓ YES

↓ NO

Replace the fuse.

EBS01044

2. Battery

- Check the condition of the battery. Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.

Minimum open-circuit voltage
12.8 V or more at 20°C (68°F)

- Is the battery OK?

↓ YES

↓ NO

- Clean the battery terminals.
- Recharge or replace the battery.

EBS01051

3. Starter motor

- Connect the positive battery terminal ① and starter motor lead ② with a jumper lead ③.

⚠ WARNING

- A wire that is used as a jumper lead must have at least the same capacity or more as that of the battery lead, otherwise the jumper lead may burn.
- This check is likely to produce sparks, therefore make sure nothing flammable is in the vicinity.

• Does the starter motor turn?

↓ YES

↓ NO

Repair or replace the starter motor.

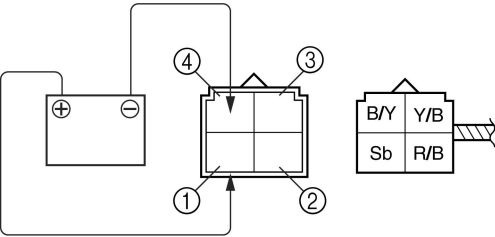
EBS01052

4. Starting circuit cut-off relay

- Remove the starting circuit cut-off relay from the wire harness.
- Connect the pocket tester ($\Omega \times 1$) and battery (12 V) to the starting circuit cut-off relay as shown.

Positive battery terminal → red/black ①
Negative battery terminal → sky blue ② or black/yellow ③

Positive tester probe → red/black ①
Negative tester probe → yellow/black ④



• Does the starting circuit cut-off relay have continuity between red/black and yellow/black?

↓ YES

↓ NO

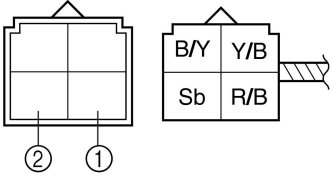
Replace the starting circuit cut-off relay.

EBS01053

5. Starting circuit cut-off relay (diode)

- Remove the starting circuit cut-off relay from the wire harness.
- Connect the pocket tester ($\Omega \times 1$) to the starting circuit cut-off relay as shown.
- Measure the starting circuit cut-off relay for continuity as follows.

Positive tester probe → sky blue ① Negative tester probe → red/black ②	Continuity
Positive tester probe → red/black ② Negative tester probe → sky blue ①	No continuity



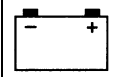
NOTE: _____
 When you switch the tester's positive and negative probes, the readings in the above chart will be reversed.

• Are the testing readings correct?

↓ YES

↓ NO

Replace the starting circuit cut-off relay.



EBS01054

6. Starter relay

- Disconnect the starter relay coupler from the wire harness.
- Connect the pocket tester ($\Omega \times 1$) and battery (12 V) to the starter relay as shown.

Positive battery terminal → blue/black ①
Negative battery terminal → yellow/black ②

Positive tester probe → red ③
Negative tester probe → black ④

• Does the starter relay have continuity between red and black?

↓ YES

↓ NO

Replace the starter relay.

EBS01041

7. Main switch

- Check the main switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the main switch OK?

↓ YES

↓ NO

Replace the main switch.

EBS01042

8. Engine stop switch

- Check the engine stop switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the engine stop switch OK?

↓ YES

↓ NO

Replace the handle-bar switch.

EBS01046

9. Neutral switch

- Check the neutral switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the neutral switch OK?

↓ YES

↓ NO

Replace the neutral switch.

EBS01056

10. Clutch switch

- Check the clutch switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the clutch switch OK?

↓ YES

↓ NO

Replace the clutch switch.

EBS01057

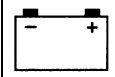
11. Start switch

- Check the start switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the start switch OK?

↓ YES

↓ NO

Replace the handle-bar switch.



EBS01059

12. Wiring

- Check the entire starting system's wiring. Refer to "CIRCUIT DIAGRAM".
- Is the starting system's wiring properly connected and without defects?



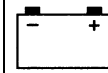
YES



NO

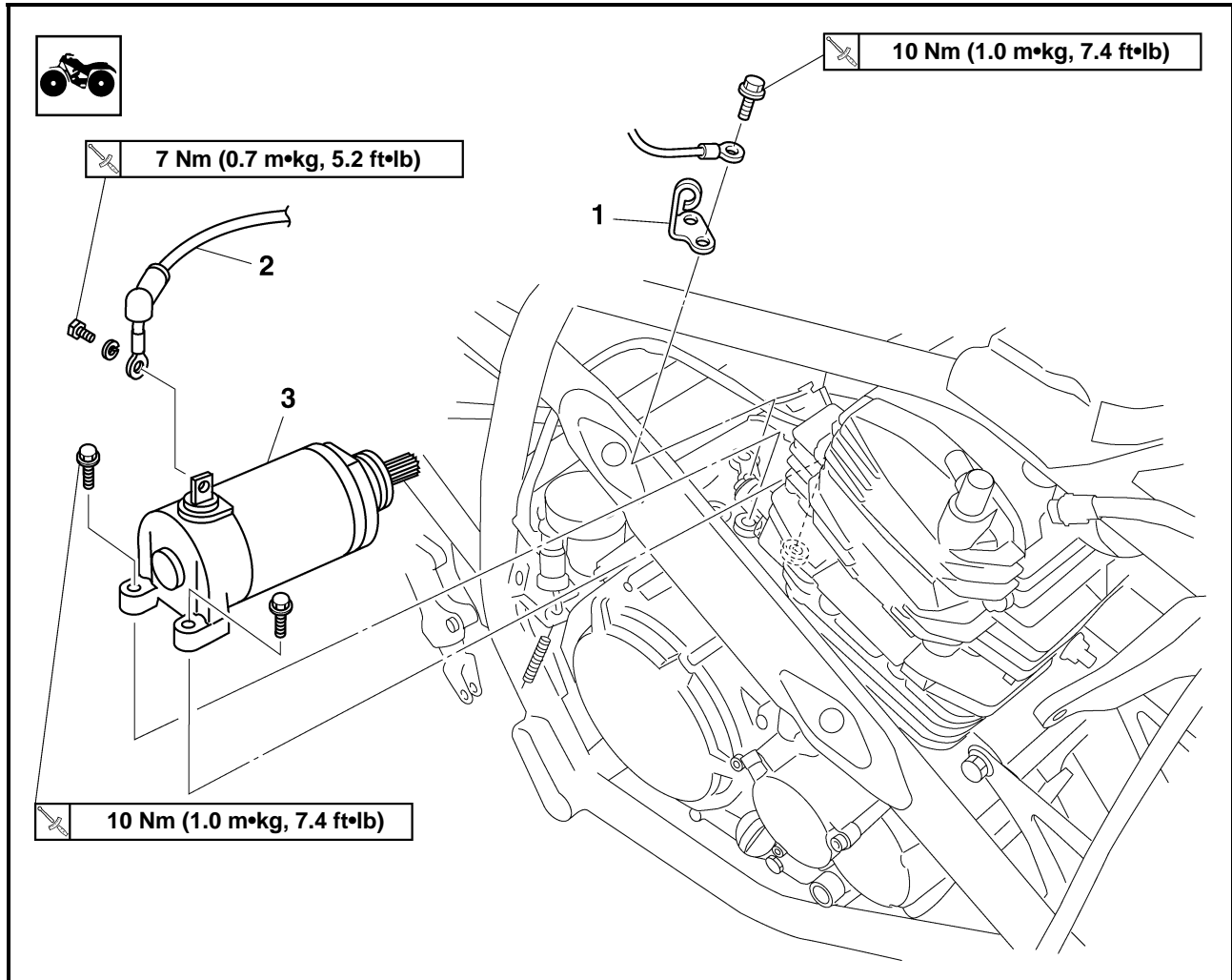
The starting system circuit is OK.

Properly connect or repair the starting system's wiring.



EBS01061

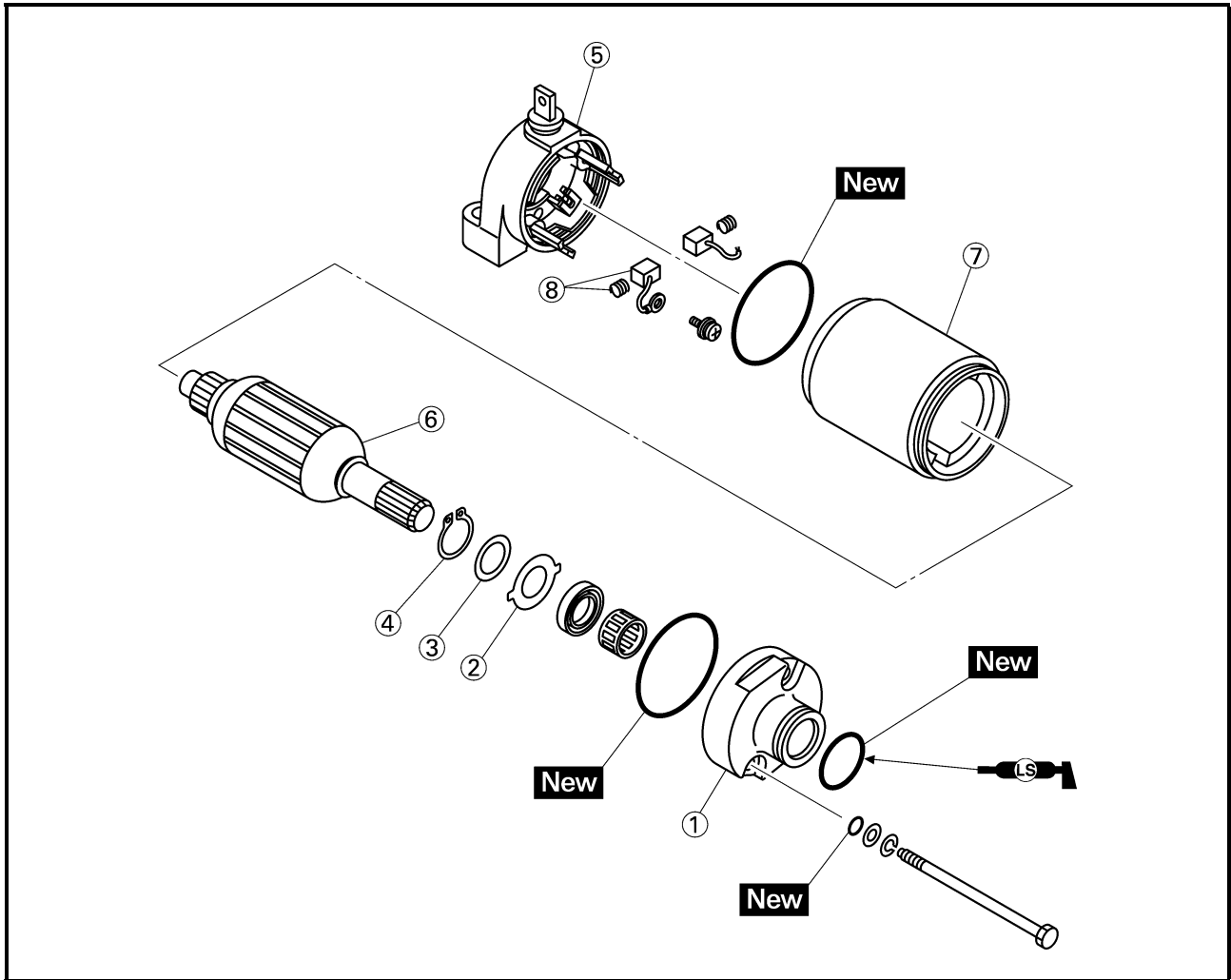
STARTER MOTOR



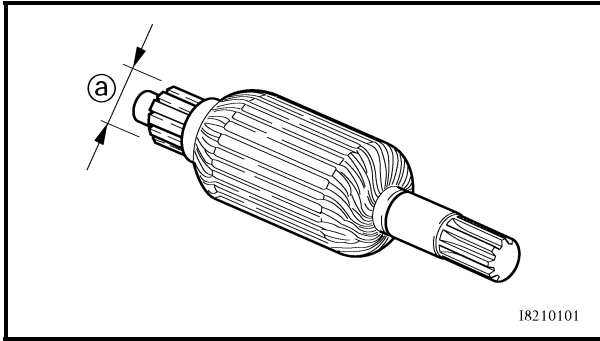
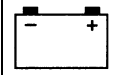
Order	Job/Part	Q'ty	Remarks
	Removing the starter motor		Remove the parts in the order listed.
	Exhaust pipe		Refer to "ENGINE REMOVAL" in chapter 4.
	Idle gear cover and idle gear		
1	Clutch cable holder	1	
2	Starter motor lead	1	Disconnect.
3	Starter motor	1	
			For installation, reverse the removal procedure.



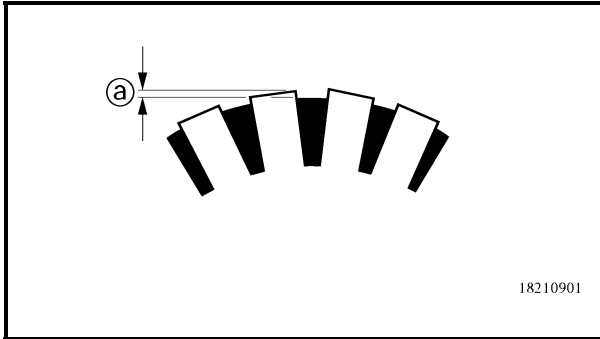
EBS01062



Order	Job/Part	Q'ty	Remarks
	Disassembling the starter motor		Remove the parts in the order listed.
①	Front bracket	1	Refer to "ASSEMBLING THE STARTER MOTOR".
②	Tang washer	1	
③	Plate washer	1	
④	Circlip	1	
⑤	Rear bracket/Brush	1/1	
⑥	Armature assembly	1	
⑦	Starter motor yoke	1	
⑧	Brush/spring	2/2	For assembly, reverse the disassembly procedure.



18210101



18210901

EBS01064

CHECKING THE STARTER MOTOR

1. Check:
 - commutator
Dirt → Clean with 600-grit sandpaper.
2. Measure:
 - commutator diameter (a)
Out of specification → Replace the starter motor.



Commutator wear limit
21 mm (0.83 in)

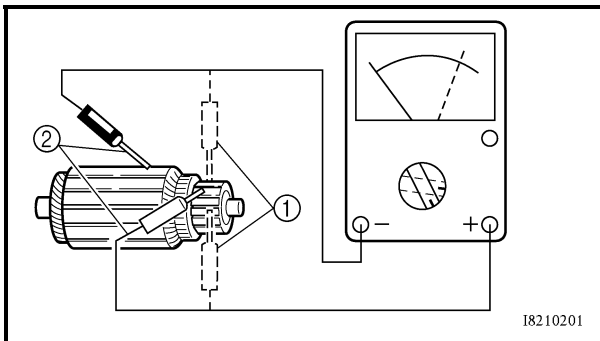
3. Measure:
 - mica undercut (a)
Out of specification → Scrape the mica to the proper measurement with a hacksaw blade that has been grounded to fit the commutator.



Mica undercut
1.5 mm (0.06 in)

NOTE:

The mica of the commutator must be undercut to ensure proper operation of the commutator.



18210201

4. Measure:
 - armature assembly resistances (commutator and insulation)
Out of specification → Replace the starter motor.



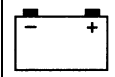
- a. Measure the armature assembly resistances with the pocket tester.



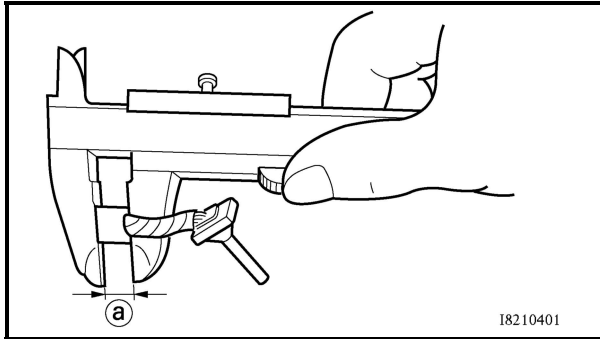
Pocket tester
90890-03112
Analog pocket tester
YU-03112-C



Armature coil
Commutator resistance ①
0.013 ~ 0.015 Ω at 20°C (68°F)
Insulation resistance ②
Above 1 MΩ at 20°C (68°F)



b. If any resistance is out of specification, replace the starter motor.



5. Measure:
- brush length (a)
Out of specification → Replace the brushes as a set.

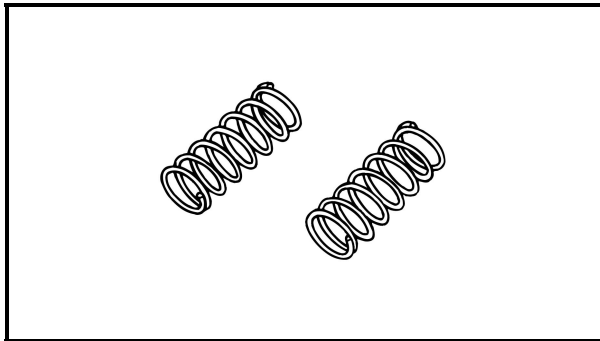


Brush length wear limit
3.5 mm (0.14 in)

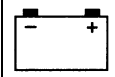
6. Measure:
- brush spring force
Out of specification → Replace the brush springs as a set.



Brush spring force
5.52 ~ 8.28 N
(563 ~ 844 gf, 19.85 ~ 29.78 oz)



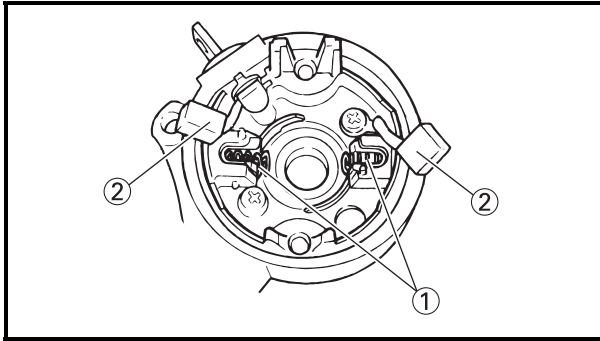
7. Check:
- gear teeth
Damage/wear → Replace the gear.
8. Check:
- bushing
 - bearing
 - oil seal
Damage/wear → Replace the defective part(s).



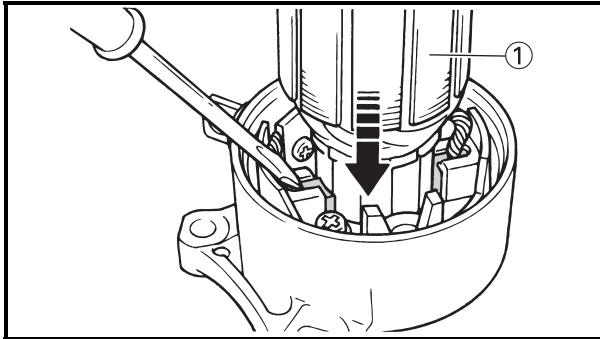
EBS00515

ASSEMBLING THE STARTER MOTOR

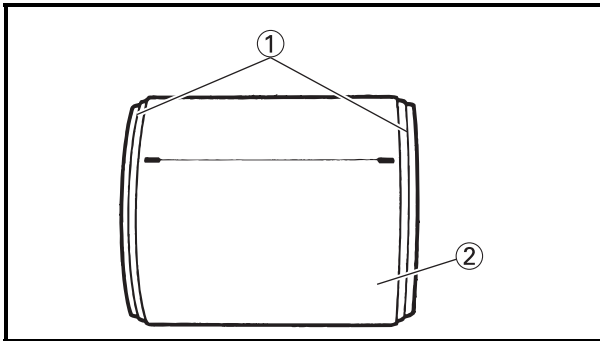
1. Install:
 - brush spring ①
 - brush ②



2. Install:
 - armature coil ①

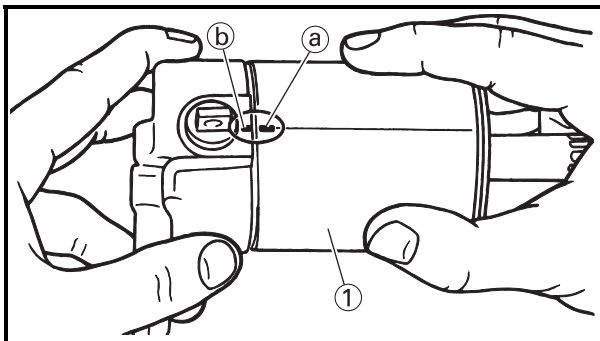


3. Install
 - O-rings ① to starter motor yoke ②.



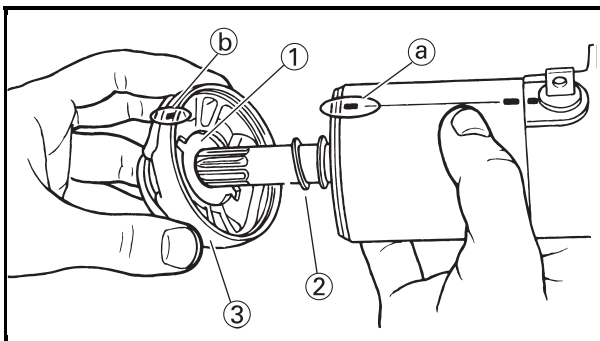
4. Install
 - Starter motor yoke ①

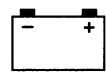
NOTE: _____
Align the match marks (a) on the starter motor yoke ① with the match marks (b) on the rear bracket.



5. Install
 - Tang washer ①
 - Plate washer ②
 - Front bracket ③

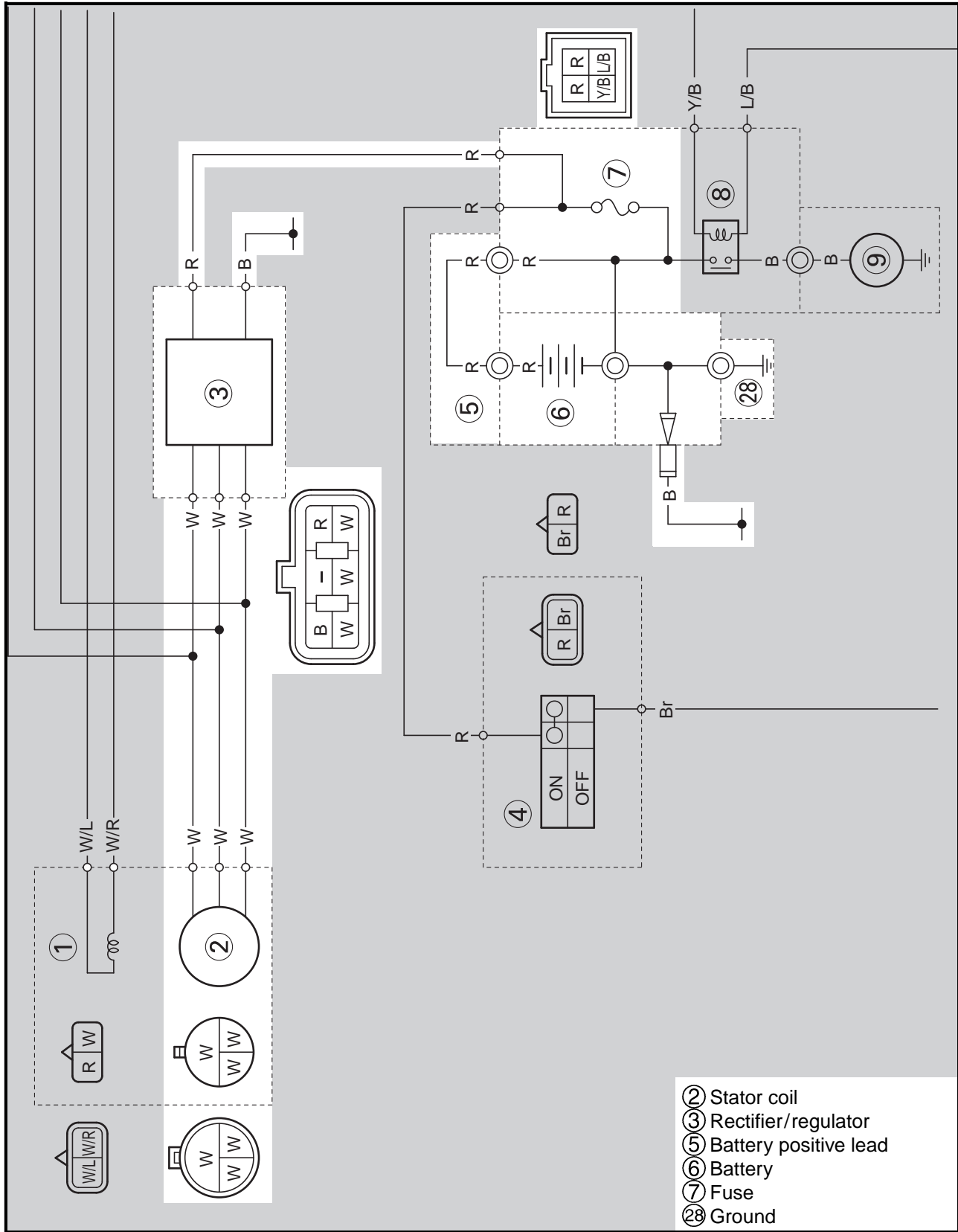
NOTE: _____
Align the match marks (a) on the starter motor yoke with the match marks (b) on the front bracket.





EBS00516

CHARGING SYSTEM
CIRCUIT DIAGRAM



- ② Stator coil
- ③ Rectifier/regulator
- ⑤ Battery positive lead
- ⑥ Battery
- ⑦ Fuse
- Ⓒ Ground

EBS01065

TROUBLESHOOTING


The battery is not being charged.

Check:

1. fuse
2. battery
3. charging voltage
4. stator coil resistance
5. wiring connections
(of the entire charging system)

NOTE:

- Before troubleshooting, remove the following part(s):
 1. seat
 2. front panel
 3. front fender
 4. rear fender
 5. side cover
- Troubleshoot with the following special tool(s).

	<p>Pocket tester 90890-03112 Analog pocket tester YU-03112-C</p>
--	---

EBS01043


<p>1. Fuse</p> <ul style="list-style-type: none"> • Check the fuse for continuity. Refer to "CHECKING THE SWITCHES". • Is the fuse OK?
--

↓ YES

↓ NO

Replace the fuse.

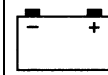
EBS01044

2. Battery	
<ul style="list-style-type: none"> • Check the condition of the battery. Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3. 	
	<p>Minimum open-circuit voltage 12.8 V or more at 20°C (68°F)</p>
<ul style="list-style-type: none"> • Is the battery OK? 	

↓ YES

↓ NO

- Clean the battery terminals.
- Recharge or replace the battery.



EBS01066

3. Charging voltage

- Connect the engine tachometer to on to the ignition coil.
- Connect the pocket tester (DC 20 V) to the battery as shown.

Positive tester probe → positive battery terminal ①
Negative tester probe → negative battery terminal ②

- Start the engine and let it run at approximately 5,000 r/min.
- Measure the charging voltage.

Charging voltage
 14 V at 5,000 r/min

NOTE:
 Make sure the battery is fully charged.

• Is the charging voltage within specification?



The charging circuit is OK.

EBS01100

4. Stator coil resistance

- Disconnect the AC magneto coupler from the wire harness.
- Connect the pocket tester ($\Omega \times 1$) to the charging coils.

Tester (+) lead → White terminal ①
Tester (-) lead → White terminal ②

Tester (+) lead → White terminal ①
Tester (-) lead → White terminal ③

Tester (+) lead → White terminal ②
Tester (-) lead → White terminal ③

- Measure the stator coil resistance.

Charging coil resistance:
 0.688 ~ 1.032 Ω at 20°C (68°F)

↓ YES ↓ NO

Replace the pickup coil/stator assembly.

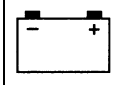
5. Wiring

- Check the entire charging system's wiring. Refer to "CIRCUIT DIAGRAM".
- Is the charging system's wiring properly connected and without defects?

↓ YES ↓ NO

Replace the rectifier/regulator.

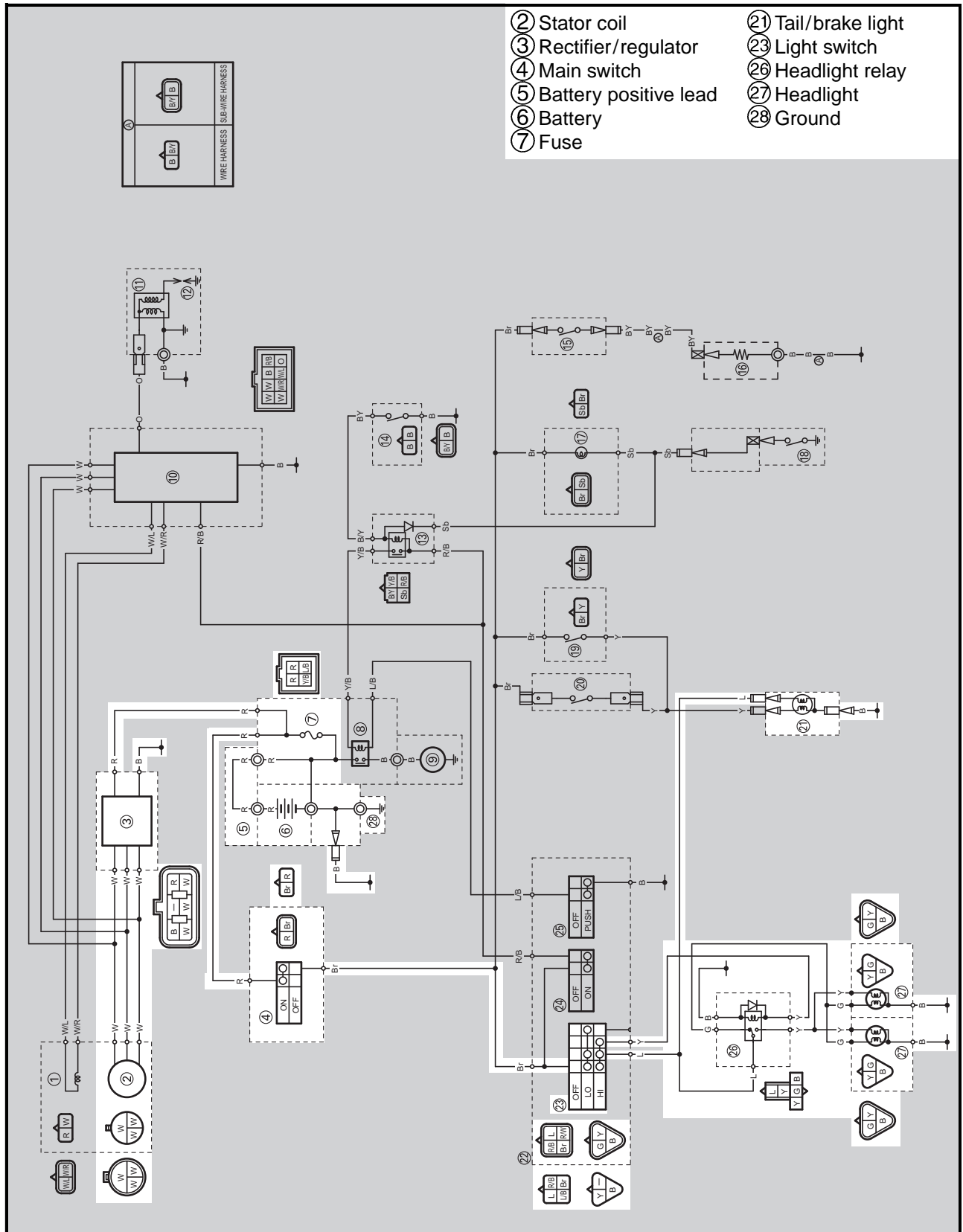
Replace the diode and properly connect or repair the charging system's wiring.



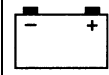
EBS00518

LIGHTING SYSTEM

CIRCUIT DIAGRAM



- ② Stator coil
- ③ Rectifier/regulator
- ④ Main switch
- ⑤ Battery positive lead
- ⑥ Battery
- ⑦ Fuse
- ⑳ Tail/brake light
- ㉑ Light switch
- ㉒ Headlight relay
- ㉓ Headlight
- ㉔ Ground



EBS01067

TROUBLESHOOTING

Any of the following fail to light: head-light, tail/brake light.

Check:

1. light switch
2. Stator coil resistance
3. wiring connections
(of the entire lighting system)

NOTE:

- Before troubleshooting, remove the following part(s):
 1. seat
 2. front panel
 3. front fender
 4. rear fender
 5. side cover
- Troubleshoot with the following special tool(s).



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

EAS00783

1. Light switch

- Check the light switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the light switch OK?

↓ YES

↓ NO

Replace the handle-bar switch.

EAS00776

2. Stator coil resistance

- Disconnect the AC magneto coupler from the wire harness.
- Connect the pocket tester ($\Omega \times 1$) to the charging coils.

Tester (+) lead → White terminal ①

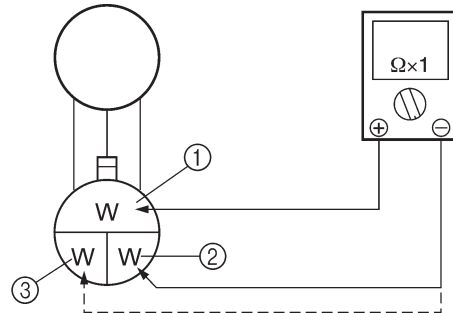
Tester (-) lead → White terminal ②

Tester (+) lead → White terminal ①

Tester (-) lead → White terminal ③

Tester (+) lead → White terminal ②

Tester (-) lead → White terminal ③



- Measure the stator coil resistance.

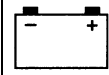


Charging coil resistance:
0.688 ~ 1.032 Ω at 20°C (68°F)

↓ YES

↓ NO

Replace the pickup coil/stator assembly.



EBS01069

3. Wiring

- Check the entire lighting system's wiring. Refer to "CIRCUIT DIAGRAM".
- Is the lighting system's wiring properly connected and without defects?



Check the condition of each of the lighting system's circuits. Refer to "CHECKING THE LIGHTING SYSTEM".



Properly connect or repair the lighting system's wiring.

EBS01070

CHECKING THE LIGHTING SYSTEM

1. The headlights fail to come on.

1. Headlight bulb and socket

- Check the headlight bulb and socket for continuity. Refer to "CHECKING THE BULBS AND BULB SOCKETS".
- Are the headlight bulb and socket OK?



Replace the headlight bulb, socket or both.



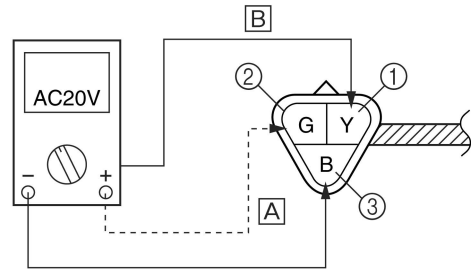
2. Voltage

- Connect the pocket tester (AC 20 V) to the headlight couplers as shown.

- [A] When the light switch is set to "LO"
- [B] When the light switch is set to "HI"

Headlight coupler (wire harness side)

Headlight
Positive tester probe → yellow ① or green ②
Negative tester probe → black ③



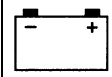
- Set the main switch to "ON".
- Start the engine.
- Set the light switch to "LO" or "HI".
- Measure the voltage (AC 12 V) of yellow ① or green ② on the headlight coupler (wire harness side).
- Is the voltage within specification?



This circuit is OK.



Replace the rectifier/regulator.



2. The tail/brake light fails to come on.

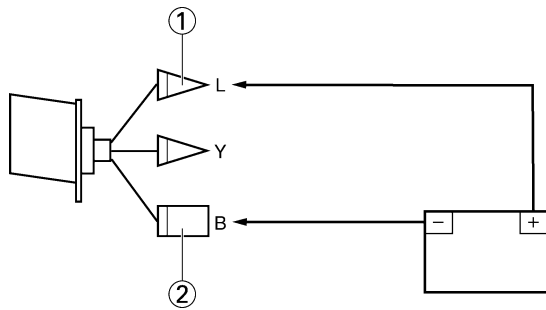
1. Tail/brake light bulb and bulb socket (4D31)
- Check the tail/brake light bulb and socket for continuity. Refer to “CHECKING THE BULBS AND BULB SOCKETS”.
 - Are the tail/brake light bulb and socket OK?



Replace the tail/brake light bulb, socket or both.

2. Tail/brake light (4D35, 4D39)
- Disconnect the tail/brake light coupler.
 - Connect the battery (12 V) to the tail/brake light coupler terminals as shown.
 - When the jumper leads are connected to the terminals, the tail/brake light should illuminate.

Positive battery terminal → blue ①
Negative battery terminal → black ②



- Is the tail/brake light OK?



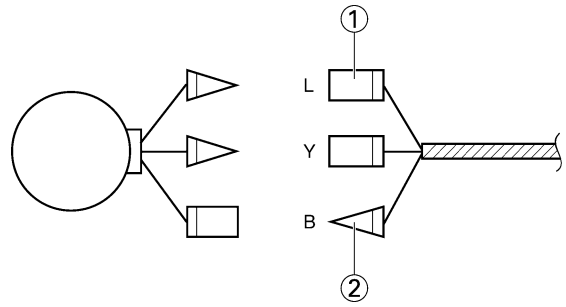
Replace the tail/brake light.

3. Voltage

- Connect the pocket tester (AC 20 V) to the tail/brake light coupler as shown.

Tail/brake light coupler (wire harness side)

Tail/brake light
Positive tester probe → blue ①
Negative tester probe → black ②

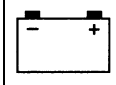


- Set the main switch to “ON”.
- Start the engine.
- Measure the voltage (AC 12 V) of blue ① on the tail/brake light coupler (wire harness side).
- Is the voltage within specification?



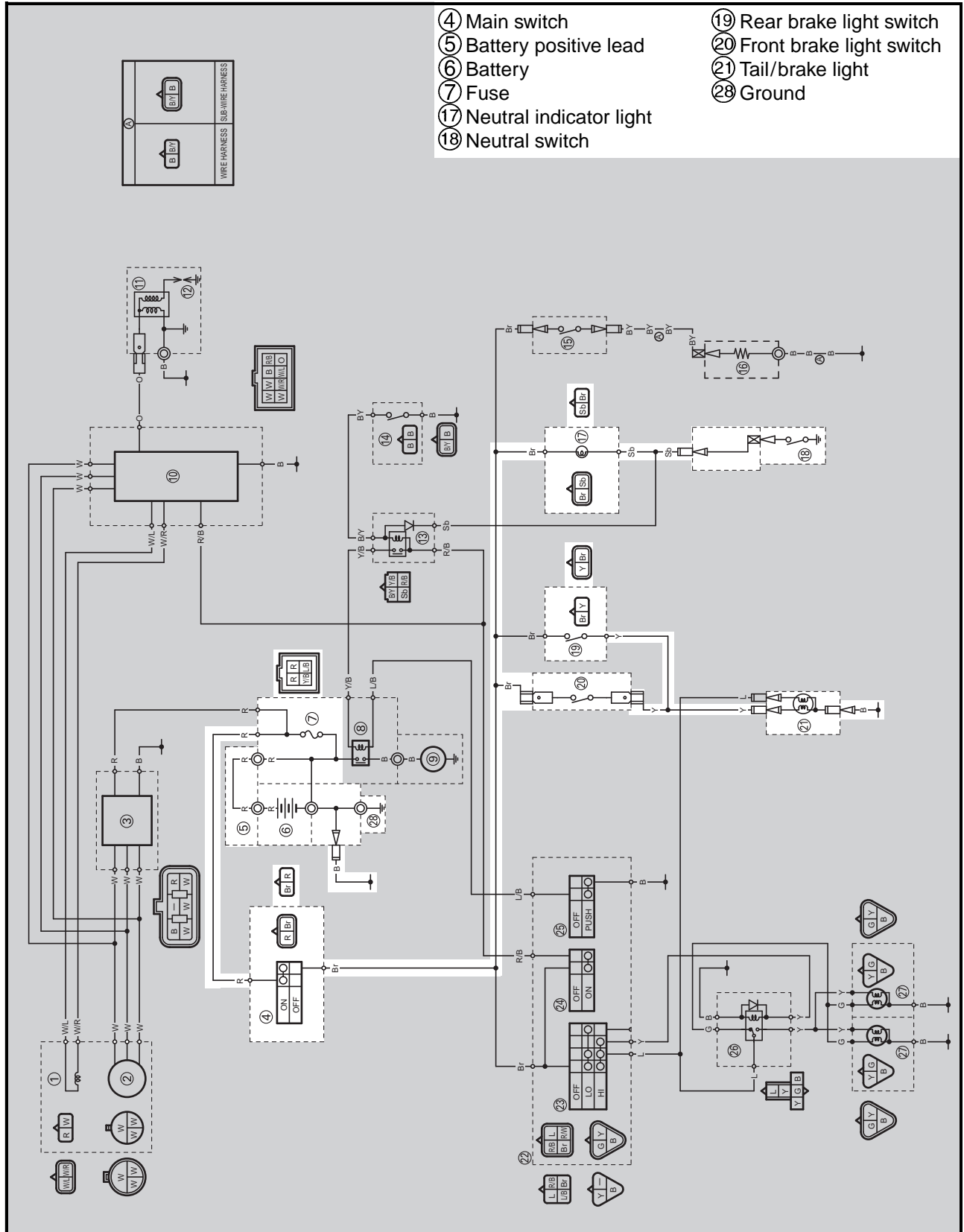
This circuit is OK.

Replace the rectifier/regulator.

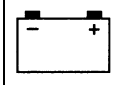


EBS00521

**SIGNAL SYSTEM
CIRCUIT DIAGRAM**



- ④ Main switch
- ⑤ Battery positive lead
- ⑥ Battery
- ⑦ Fuse
- ⑮ Neutral indicator light
- ⑯ Neutral switch
- ⑰ Rear brake light switch
- ⑱ Front brake light switch
- ⑲ Tail/brake light
- ⑳ Ground



EBS01073

TROUBLESHOOTING


Any of the following fail to light: brake light or an indicator light.

Check:

1. fuse
2. battery
3. main switch
4. wiring connections
(of the entire signaling system)

NOTE:

- Before troubleshooting, remove the following part(s):
 1. seat
 2. front fender
- Troubleshoot with the following special tool(s).

	<p>Pocket tester 90890-03112 Analog pocket tester YU-03112-C</p>
---	---

EBS01043




<p>1. Fuse</p> <ul style="list-style-type: none"> • Check the fuse for continuity. Refer to "CHECKING THE SWITCHES". • Is the fuse OK?
--

↓ YES

↓ NO

Replace the fuse.

EBS01044

<p>2. Battery</p> <ul style="list-style-type: none"> • Check the condition of the battery. Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3. 		
<table border="1"> <tr> <td style="text-align: center;"></td> <td> <p>Minimum open-circuit voltage 12.8 V or more at 20°C (68°F)</p> </td> </tr> </table>		<p>Minimum open-circuit voltage 12.8 V or more at 20°C (68°F)</p>
	<p>Minimum open-circuit voltage 12.8 V or more at 20°C (68°F)</p>	
<ul style="list-style-type: none"> • Is the battery OK? 		

↓ YES

↓ NO

• Clean the battery terminals.
 • Recharge or replace the battery.

EBS01041

<p>3. Main switch</p> <ul style="list-style-type: none"> • Check the main switch for continuity. Refer to "CHECKING THE SWITCHES". • Is the main switch OK?

↓ YES

↓ NO

Replace the main switch.

EBS01074

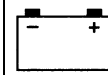
<p>4. Wiring</p> <ul style="list-style-type: none"> • Check the entire signal system's wiring. Refer to "CIRCUIT DIAGRAM". • Is the signaling system's wiring properly connected and without defects?

↓ YES

↓ NO

Check the condition of each of the signaling system's circuits. Refer to "CHECKING THE SIGNALING SYSTEM".

Properly connect or repair the signaling system's wiring.



EBS01075

CHECKING THE SIGNALING SYSTEM

EBS01076

1. The tail/brake light fails to come on.

1. Tail/brake light bulb and bulb socket (4D31)

- Check the tail/brake light bulb and bulb socket for continuity. Refer to "CHECKING THE BULBS AND BULB SOCKETS".
- Are the tail/brake light bulb and bulb socket OK?

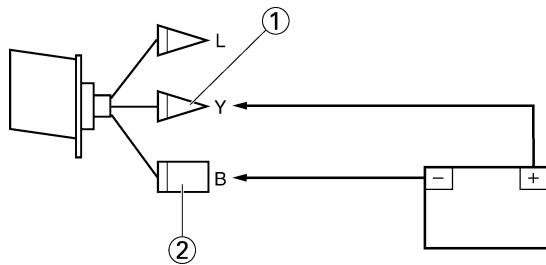


Replace the tail/brake light bulb, bulb socket or both.

2. Tail/brake light (4D35, 4D39)

- Disconnect the tail/brake light coupler.
- Connect the battery (12 V) to the tail/brake light coupler terminals as shown.
- When the jumper leads are connected to the terminals, the tail/brake light should illuminate.

Positive battery terminal → yellow ①
Negative battery terminal → black ②



• Is the tail/brake light OK?



Replace the tail/brake light.

3. Brake light switches

- Check the brake light switches for continuity. Refer to "CHECKING THE SWITCHES".
- Is the brake light switch OK?

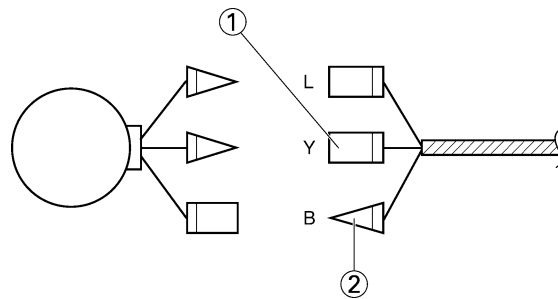


Replace the brake light switch.

4. Voltage

- Connect the pocket tester (DC 20 V) to the tail/brake light coupler (wire harness side) as shown.

Positive tester probe → yellow ①
Negative tester probe → black ②

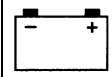


- Set the main switch to "ON".
- Pull in the brake lever or push down on the brake pedal.
- Measure the voltage (DC 12 V) of yellow ① on the tail/brake light coupler (wire harness side).
- Is the voltage within specification?



This circuit is OK.

The wiring circuit from the main switch to the tail/brake light coupler is faulty and must be repaired.



EBS01077

2. The neutral indicator light fails to come on.

1. Neutral indicator light bulb and socket

- Check the neutral indicator light bulb and socket for continuity. Refer to "CHECKING THE BULBS AND BULB SOCKETS".
- Are the neutral indicator light bulb and socket OK?



Replace the neutral indicator light bulb, socket or both.

2. Neutral switch

- Check the neutral switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the neutral switch OK?

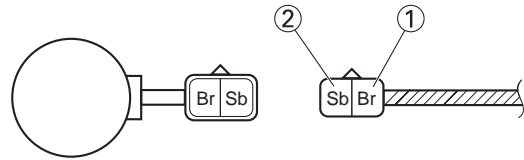


Replace the neutral switch.

3. Voltage

- Connect the pocket tester (DC 20 V) to the indicator light coupler (wire harness side) as shown.

Positive tester probe → brown ①
 Negative tester probe → sky blue ②

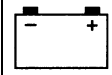


- Set the main switch to "ON".
- Measure the voltage (DC 12 V).
- Is the voltage within specification?



This circuit is OK.

The wiring circuit from the main switch to the indicator light coupler is faulty and must be repaired.



EBS01083

3. The carburetor heater fails to come on.

<p>1. Thermo switch</p> <ul style="list-style-type: none"> • Disconnect the thermo switch from the wire-harness. • Connect the pocket tester ($\Omega \times 1$) to the thermo switch lead. 		
<p>Tester positive probe \rightarrow black ① Tester negative probe \rightarrow black ②</p>		
<ul style="list-style-type: none"> • Check the thermo switch for continuity at the temperatures indicated below. 		
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; text-align: center;"> <p>11°C\pm3°C (51.8°F\pm5.4°F)</p> </td> <td style="width: 50%; text-align: center;"> <p>16°C\pm3°C (60.8°F\pm5.4°F)</p> </td> </tr> </table>	<p>11°C\pm3°C (51.8°F\pm5.4°F)</p>	<p>16°C\pm3°C (60.8°F\pm5.4°F)</p>
<p>11°C\pm3°C (51.8°F\pm5.4°F)</p>	<p>16°C\pm3°C (60.8°F\pm5.4°F)</p>	
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; text-align: center;"> <p>A COOL DOWN</p> </td> <td style="width: 50%; text-align: center;"> <p>B HEAT UP</p> </td> </tr> </table>	<p>A COOL DOWN</p>	<p>B HEAT UP</p>
<p>A COOL DOWN</p>	<p>B HEAT UP</p>	
<ul style="list-style-type: none"> • Does the thermo switch operated properly? 		

YES

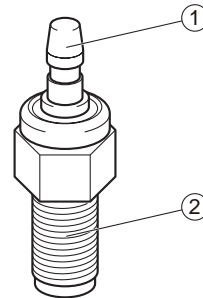
NO

Replace the thermo switch.

2. Carburetor warmer

- Remove the carburetor heating element from the carburetor.
- Connect the pocket tester ($\Omega \times 1$) to the carburetor heating element.

Tester positive probe \rightarrow heating element ①
 Tester negative probe \rightarrow heating element body ②



- Measure the carburetor heating element resistance.

	<p>Carburetor heating element resistance: 6 ~ 12 Ω (20°C)</p>
--	---

- Is the carburetor heating element OK?

YES

NO

This circuit is OK.

Replace the carburetor warmer element.

EBS00537

TROUBLESHOOTING**NOTE:**

The following troubleshooting does not cover all the possible causes of trouble. It should be helpful, however, as a guide to troubleshooting. Refer to the relative procedure in this manual for check, adjustment and replacement of parts.

STARTING FAILURE/HARD STARTING**FUEL SYSTEM****Fuel tank**

- Empty
- Clogged fuel strainer
- Clogged fuel tank breather hose
- Deteriorated or contaminated fuel

Fuel cock

- Clogged fuel hose

Carburetor

- Deteriorated or contaminated fuel
- Clogged pilot jet
- Clogged pilot air passage
- Sucked-in air
- Deformed float
- Worn needle valve
- Improperly sealed valve seat
- Improperly adjusted fuel level
- Improperly set pilot jet
- Clogged starter jet
- Choke valve malfunction

Air filter

- Clogged air filter element

ELECTRICAL SYSTEM**Spark plug**

- Improper plug gap
- Worn electrodes
- Wire between terminals broken
- Improper heat range

Ignition coil

- Broken or shorted primary/secondary
- Faulty ignition coil lead
- Broken body

CDI system

- Faulty CDI unit
- Faulty pickup coil
- Faulty lighting coil
- Faulty charging coil
- Broken woodruff key

Switches and wiring

- Faulty main switch
- Faulty engine stop switch
- Broken or shorted wiring
- Faulty neutral switch
- Faulty start switch
- Faulty clutch switch
- Faulty throttle switch
- Faulty carburetor switch
- Loose connections

Starter motor

- Faulty starter motor
- Faulty starter relay
- Faulty starting circuit cut-off relay
- Faulty starter clutch
- Faulty torque limiter

Battery

- Faulty battery
- Discharged battery



COMPRESSION SYSTEM

Cylinder and cylinder head

- Loose spark plug
- Loose cylinder head or cylinder
- Broken cylinder head gasket
- Broken cylinder gasket
- Worn, damaged or seized cylinder

Valve and camshaft

- Improperly sealed valve
- Improperly contacted valve and valve seat
- Improper valve timing
- Broken valve spring
- Seized camshaft

Piston and piston rings

- Improperly installed piston ring
- Worn, fatigued or broken piston ring
- Seized piston ring
- Seized or damaged piston

Crankcase and crankshaft

- Improperly seated crankcase
- Seized crankshaft

Valve train

- Improperly adjusted valve clearance
- Improperly adjusted valve timing

EBS00538

POOR IDLE SPEED PERFORMANCE

POOR IDLE SPEED PERFORMANCE

Carburetor

- Improperly returned choke
- Loose or clogged pilot jet
- Loose or clogged pilot air jet
- Improperly adjusted idle speed (throttle stop screw)
- Improper throttle cable play
- Flooded carburetor

Intake manifold

- Loosen carburetor joint

Electrical system

- Faulty battery
- Faulty CDI unit
- Faulty pickup coil
- Faulty ignition coil

Valve train

- Improperly adjusted valve clearance

Air filter

- Clogged air filter element
- Loosen air filter joint

EBS00539

POOR MEDIUM AND HIGH-SPEED PERFORMANCE

POOR MEDIUM AND HIGH-SPEED PERFORMANCE

Refer to “STARTING FAILURE/HARD STARTING” and “POOR IDLE SPEED PERFORMANCE—Valve train”.

Carburetor

- Improper jet needle clip position
- Improperly adjusted fuel level
- Clogged or loose main jet
- Deteriorated or contaminated fuel

Air filter

- Clogged air filter element



EBS00541

**FAULTY GEAR SHIFTING
HARD SHIFTING**

Refer to "CLUTCH DRAGGING".

SHIFT PEDAL DOES NOT MOVE

Shift shaft

- Bent shift shaft

Shift drum and shift forks

- Groove jammed with impurities
- Seized shift fork
- Bent shift fork guide bar

Transmission

- Seized transmission gear
- Jammed impurities
- Incorrectly assembled transmission

Shift guide

- Broken shift guide

JUMPS OUT GEAR

Shift shaft

- Improperly adjusted shift lever position
- Improperly returned stopper lever

Shift forks

- Worn shift fork

Shift drum

- Improper thrust play
- Worn shift drum groove

Transmission

- Worn gear dog

EBS00545

**CLUTCH SLIPPING/Dragging
CLUTCH SLIPPING**

Clutch

- Loose clutch spring
- Fatigued clutch spring
- Worn friction plate
- Worn clutch plate
- Incorrectly assembled clutch

Engine oil

- Low oil level
- Improper quality (low viscosity)
- Deterioration

CLUTCH DRAGGING

Clutch

- Warped pressure plate
- Unevenly tensioned clutch springs
- Loose clutch boss nut
- Burnt primary driven gear bushing
- Bent clutch plate
- Swollen friction plate
- Broken clutch boss

Engine oil

- High oil level
- Improper quality (high viscosity)
- Deterioration



EBS00547

OVERHEATING

OVERHEATING

Ignition system

- Improper spark plug gap
- Improper spark plug heat range
- Faulty CDI unit

Fuel system

- Improper carburetor main jet (improper setting)
- Improper fuel level
- Clogged air filter element

Compression system

- Heavy carbon deposit

Engine oil

- Improper oil level
- Improper oil viscosity
- Inferior oil quality

Brake

- Brake drag

EBS00550

FAULTY BRAKE

POOR BRAKING EFFECT

Disc brake

- Worn brake pads
- Worn disc
- Air in brake fluid
- Leaking brake fluid
- Faulty master cylinder kit cup
- Faulty caliper kit seal
- Loose union bolt
- Broken brake hose and pipe
- Oily or greasy disc/brake pads
- Improper brake fluid level

EBS00551

SHOCK ABSORBER MALFUNCTION

MALFUNCTION

- Bent or damaged damper rod
- Damaged oil seal lip
- Fatigued shock absorber spring
- Leaking oil or gas



EBS00552

UNSTABLE HANDLING

UNSTABLE HANDLING

Handlebar

- Improperly installed or bent

Steering

- Incorrect toe-in
- Bent steering stem
- Improperly installed steering stem
- Damaged bearing or bearing race
- Bent tie-rods
- Deformed steering knuckles

Tires

- Uneven tire pressures on both sides
- Incorrect tire pressure
- Uneven tire wear

Wheels

- Deformed wheel
- Loose bearing
- Bent or loose wheel axle
- Excessive wheel runout

Frame

- Bent
- Damaged frame

Swingarm

- Worn bearing or bushing
- Bent or damaged

EBS00553

LIGHTING SYSTEM

HEADLIGHT DOES NOT COME ON

- Improper bulb
- Too many electric accessories
- Hard charging (broken stator coil and/or faulty rectifier/regulator)
- Incorrect connection
- Improperly grounded
- Poor contacts (main or light switch)
- Bulb life expired

TAIL/BRAKE LIGHT DOES NOT LIGHT

- Wrong tail/brake light bulb
- Too many electrical accessories
- Hard charging (broken stator coil and/or faulty rectifier/regulator)
- Incorrect connection
- Improperly grounded
- Poor contacts (main or light switch)
- Burnt-out tail/brake light bulb

BULB BURNT OUT

- Improper bulb
- Faulty battery
- Faulty rectifier/regulator
- Improperly grounded
- Faulty main and/or light switch
- Bulb life expired

TAIL/BRAKE LIGHT BULB BURNT OUT

- Wrong tail/brake light bulb
- Faulty battery
- Faulty rectifier/regulator
- Improperly grounded
- Faulty main and/or light switch
- Incorrectly adjusted rear brake light switch
- Tail/brake light bulb life expired

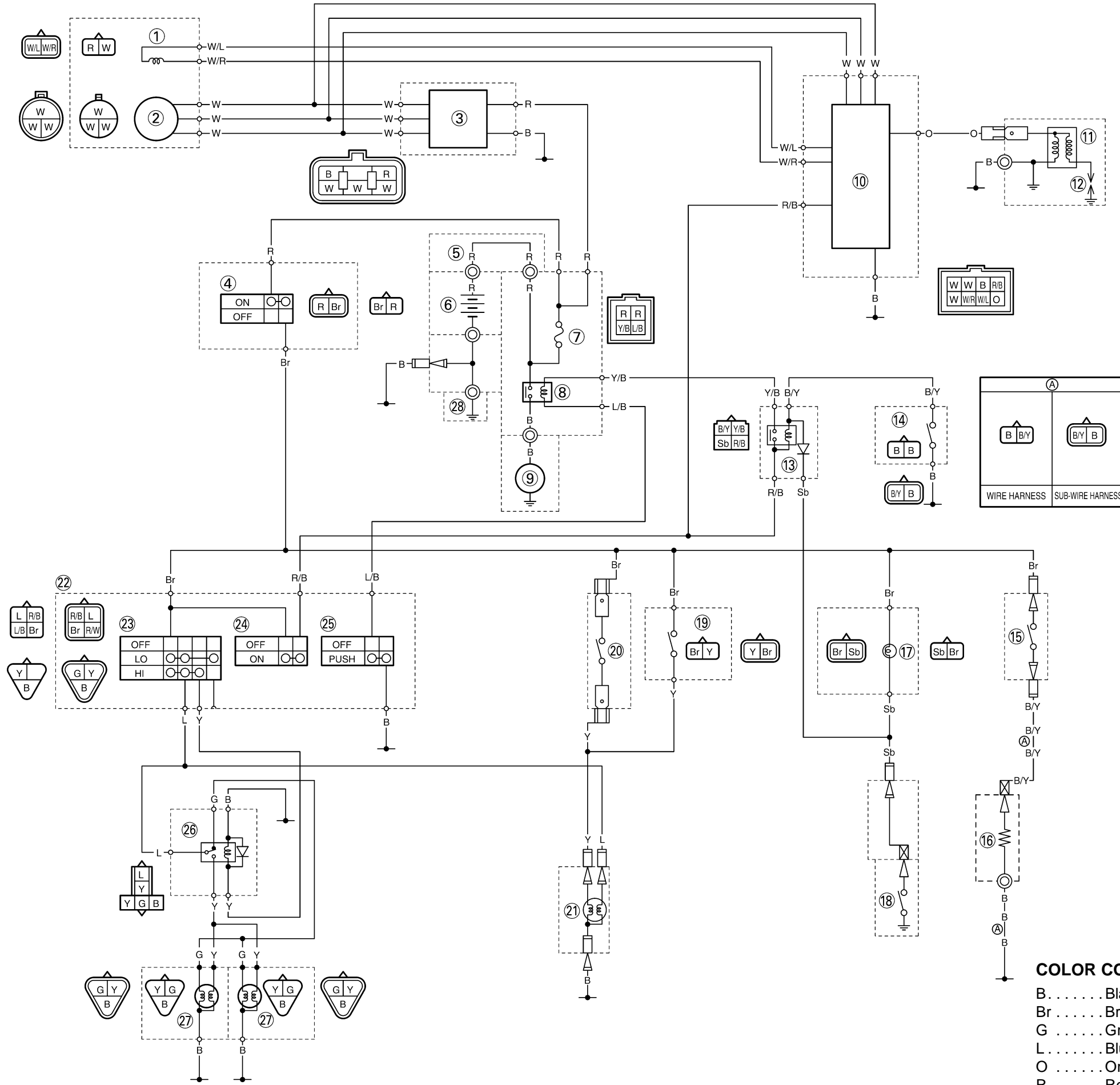


YAMAHA MOTOR CO., LTD.
2500 SHINGAI IWATA SHIZUOKA JAPAN

PRINTED IN U.S.A.

YFM250RX WIRING DIAGRAM

- ① Pickup coil
- ② Stator coil
- ③ Rectifier/regulator
- ④ Main switch
- ⑤ Battery positive lead
- ⑥ Battery
- ⑦ Fuse
- ⑧ Starter relay
- ⑨ Starter motor
- ⑩ CDI unit
- ⑪ Ignition coil
- ⑫ Spark plug
- ⑬ Starting circuit cut-off relay
- ⑭ Clutch switch
- ⑮ Thermo switch
- ⑯ Carburetor warmer
- ⑰ Neutral indicator light
- ⑱ Neutral switch
- ⑲ Rear brake light switch
- ⑳ Front brake light switch
- ㉑ Tail/brake light
- ㉒ Handlebar switch
- ㉓ Light switch
- ㉔ Engine stop switch
- ㉕ Start switch
- ㉖ Headlight relay
- ㉗ Headlight
- ㉘ Ground



COLOR CODE

- | | | |
|----------------|-----------------------|------------------------|
| B. Black | Sb Sky blue | R/W Red/White |
| Br Brown | W White | W/L White/Blue |
| G Green | Y Yellow | W/R White/Red |
| L Blue | B/Y Black/Yellow | Y/B Yellow/Black |
| O Orange | L/B Blue/Black | |
| R. Red | R/B Red/Black | |